Rhodora

JOURNAL OF THE

NEW ENGLAND BOTANICAL CLUB

Conducted and published for the Club, by

MERRITT LYNDON FERNALD, Editor-in-Chief

CHARLES ALFRED WEATHERBY
ALBERT FREDERICK HILL
STUART KIMBALL HARRIS } Associate Editors

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Vol. 46. January, 1944. No. 541.

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PANICUM BENNERI: FIGS. 1 and 2, × 1; FIG. 3, × 3; FIGS. 4 and 5, × 10; all from TYPE

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CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD UNIVERSITY—NO. CL

OVERLOOKED SPECIES, TRANSFERS AND NOVELTIES IN THE FLORA OF EASTERN NORTH AMERICA

M. L. Fernald

(Plates 807–816)

During a restudy of the *Liliaceae* of the Gray's Manual area I was soon confronted by the many species proposed by Rafinesque in one of his relatively careful and trustworthy works, Autikon Botanikon (1840), a book so rare, until the offset of it issued by the Arnold Arboretum, that only casual names from it (and those picked up through other sources) were caught by the editors of Index Kewensis, Dr. Merrill is engaged on a bibliographic study of great extent, dealing with this and other neglected works of Rafinesque. It is, consequently, not appropriate here to go into further detail than to note a few species in Autikon Botanikon which have immediately to be taken into account in my studies. Very soon I found Rafinesque referring to species of Bartram, and on checking Bartram's Travels (1791) the same situation was found: only casual names of species by Bartram were entered in Index Kewensis, these picked up from the writings of others who had cited them. Accordingly, it was necessary to study Bartram's Travels, with such limited knowledge of the flora of the southeastern United States as I have. The present Contribution, therefore, is made up partly of consideration of some of the species of Bartram, some in Rafinesque's

Autikon Botanikon, some based on study of photographs of types of Linnaeus in the *Liliaceae,* and the usual miscellany which has accumulated in recent months. The items are arranged in systematic sequence.

PANICUM (sub-§ LANUGINOSA) **Benneri,** sp. nov. (TAB. 807), planta cespitosa 1.7–3.5 dm. alta; culmis firmis erectis basi 1–1.5 mm. diametro, internodiis ad 7.5 cm. longis pilosis pilis adscendentibus; nodis barbatis; foliis lanceolatis firmis valde adscendentibus glabris vel subtus sparsissime breviterque pilosis 3.5–6.5 cm. longis 5–8 mm. latis 36–42-nerviis basi villoso-ciliatis, vaginis subhorizontaliter hirsutis pilis 1–1.5 mm. longis basi bullatis, ligulis 2–3 mm. longis; paniculis primariis breviter exsertis ellipsoideo-ovoideis 2.5–6 cm. longis 1.5–4 cm. diametro, rhachi imo hirtello sparsissime villosoque, ramis patento-adscendentibus ramulis subsimplicibus, pedicellis 2–6 mm. longis glabris; spiculis pubescentibus ellipsoideis basi apiceque obtusis 2.2–2.6 mm. longis 1.2–1.4 mm. latis, gluma inferiore perbrevi deltoideo-rotundata subapiculata 0.5–0.8 mm. longa, superiore lemmateque sterile aequilongis valde costatis fructus lucidos subaequantibus.—NEW JERSEY: old field along Delaware River, about 1½ miles east of Raven Rock, Hunterdon County, June 7, 1941, *Walter M. Benner,* no. 9635, TYPE in Herb. Gray.; ISOTYPE in Herb. Phil. Acad.

By the treatments of Hitchcock and Chase, of Hitchcock's *Manual* and my own manuscript-treatment *Panicum Benneri,* traced through the keys, comes directly to *P. villosissimum* Ell. Its very stiff habit, glabrous or essentially glabrous, short firm leaves, the very short and broad first glume of the spikelet, short-peduncled panicle, only slight (instead of usually pronounced) development of branches at the time of primary anthesis, and the relatively short and strongly pustular-based pubescence of the sheaths at once distinguish it. In *P. villosissimum* the culms are 2–7 dm. high and the leaf-blades of the vernal culms 6–11 cm. long, and 5–10 mm. wide, more or less pubescent on both faces; in *P. Benneri* the stiffly erect culms are 1.7–3.5 dm. high, the leaf-blades more lanceolate, 3.5–6.5 cm. long and 5–8 mm. wide, the upper surface hard and glabrous, the lower barely and minutely pilose, while the strongly pustular-based hairs of the sheaths of *P. Benneri* are shorter than the most often slender and more villous sheath-hairs of *P. villosissimum.* As above noted, *P. villosissimum,* while the vernal or primary panicles are intact, usually has well developed axillary

branches; in *P. Benneri* only a few, and those very short, such branches are developed. In *P. villosissimum* the fully developed primary panicles are 4–10 cm. long and on peduncles 0.3–1.7 dm. long; in *P. Benneri* the primary panicles are 2.5–6 cm. long and on peduncles only 0.5–4 cm. long. The first glume of *P. villosissimum* is ovate, one fourth to two fifths as long as the spikelet; in *P. Benneri* broadly deltoid-rotund and one fifth to barely one fourth the length of the spikelet.

In its very short and broad first glume the spikelet of *Panicum Benneri* suggests some variations of the heteromorphic *P. lanuginosum,* such as var. *fasciculatum* (Torr.) Fern. (*P. tennesseense* Ashe) or var. *septentrionale* Fern.; but its spikelets are altogether too large and the panicle too simply branched. In *P. lanuginosum* and its varieties the secondary branches of the panicle are themselves branched (whence *P. implicatum* Scribn.).

The once-forked branching of the panicle of *P. Benneri* is similar to that of *P. meridionale* (with spikelets 1.3–1.6, instead of 2.2–2.6 mm. long). It also suggests the panicle of the relatively northern *P. subvillosum* Ashe, but that characteristic species has the leaf-sheaths mostly equaling or exceeding, instead of shorter than the internodes, and appressed-pilose, instead of divergently hirsute with pustular-based hairs. Furthermore the axis of the panicle of *P. subvillosum* is appressed-pilose to glabrate, in *P. Benneri* divergently hirtellous, with some horizontally spreading villi; the spikelets of *P. subvillosum* are 1.8–2 mm. long, 0.9 mm. broad, and the prolonged first glume is one third to half the length of the spikelet.

Panicum Benneri, with which it is a privilege to associate the name of the keen and always helpful student of his local flora, Walter Mackinnett Benner, its discoverer, seems to be a real species. Whether it is relatively northern, as its type-region suggests, we do not know. It is more likely so, and to be sought in northeastern Pennsylvania and southern New York, than an extension from farther south in New Jersey and Pennsylvania where the small army of keen explorers would long ago have found it. Mr. Benner has most generously defrayed the expense of Plate 807.

In Plate 807, figs. 1 and 2 are portions of the type of Panicum Benneri, × 1; fig. 3, internode and cauline sheath, × 3; fig. 4, axis of panicle, × 10; fig. 5, spikelet, × 10.

Xyris albiflora Raf. Aut. Bot. 190 (1840). *X. torta pallescens* C. Mohr, Contrib. U. S. Nat. Herb. vi. (Pl. Life Alab.), 428 (1901). *X. pallescens* (C. Mohr) Small, Fl. Se. U. S. 234 and 1328 (1903).

This distinctive white-flowered species of northwestern Florida and Alabama is related to *X. flexuosa* Muhl. and *X. fimbriata* Ell. in having exserted and fimbriate sepal-tips. It was well characterized by Rafinesque, who recognized its affinity with the latter species:

1420, X. or Jupica? *albiflora* Raf. (X. cylindrica Baldw. mpt.) fol. strictis ensatis lato-planis striatis, scapis duplo longior teres anceps. sulcatis, capitulis ellipt. subcyl. obt. bract. dilatatis integris vel emarg. —Florida, disc. by Baldw. in 1815, not yet described, unless *X. fimbriata* of Elliot be very badly so, and appears rather an akin sp. leaves pedal, scape bipedal. fl. white by a note of Baldwin, while all others are yellow.

X. fistulosa Raf. l. c. (1840), based upon *X. juncea* Baldw., not R. Br., is X. Baldwiniana Schultes, Mant. (1822). His X. retusa, l. c. 190 and X. spiralis, l. c., are apparently X. torta J. E. Sm.

Luzula acuminata Raf. Aut. Bot. 193 (1840). *L. saltuensis* Fernald in Rhodora, v. 195 (1903). *Juncoides pilosum* (L.) Coville, var. *saltuense* (Fern.) Farwell in Mich. Acad. Sci. Rep. xx. 170 (1918). *L. carolinae* S. Wats., var. *saltuensis* (Fern.) Fern. in Rhodora, xl. 404 (1938).

Luzula saltuensis of woodland and thicket from Newfoundland to Saskatchewan, south into the Northern States and locally southward, was separated from the cespitose Eurasian *L. pilosa* (L.) Willd. because of its looser habit, with elongate more or less repent basal offsets, its paler and acuminate sepals and its more pointed capsules. Later (in 1938) I reduced it to varietal rank under the poorly typified *L. carolinae* S. Wats. in Proc. Am. Acad. xiv. 302 (1879), the latter southeastern plant being larger and with more forking branches to the corymb. It now seems that Rafinesque was nearly 40 years ahead of Watson and more than 60 ahead of me. There can be no doubt that his *L. acuminata* was *L. saltuensis*. His definition of it was good:

1447, *Luz. acuminata* Raf. repens, glabra, fol. lanceol. acum. striatis nervosis spiculis corymbosis congestis paucifloris fuscatis, calic. acum.—Boreal America, perhaps *J. pilosus* Mg. often blended with last, leaves broader and shorter, 3 uncial, stem semipedal, corymb. not exceeding the leaves, fl. small.

The taking up of *Luzula acuminata* (1840) necessitates the following combination

L. ACUMINATA Raf., var. **carolinae** (S. Wats.), comb. nov. *L. carolinae* S. Wats. in Proc. Am. Acad. xiv. 302 (1879). *Juncoides* (as *Juncodes*) *carolinae* (S. Wats.) Ktze. Rev. Gen. ii. 724 (1891).

LUZULA LABRADORICA Raf. l. c. (1840) was unquestionably L. PARVIFLORA (Ehrh.) Desv. (1808) or its var. *melanocarpa* (Michx.) Buchenau, which latter rests on *Juncus melanocarpus* Michx. (1803). Rafinesque's name antedates *L. labradorica* Steud. Syn. Pl. Gram. ii. 291 (1855), which is perhaps identical with it.

Rafinesque proposed nine North American species of the prophyllate *Junci*. Nothing sufficiently distinctive was given in his descriptions for us to be certain what he had. His J. FLORIDANUS, l. c. 194, was from "South Florida" and Engelmann in Trans. St. Louis Acad. Sci. ii. 451 (1866) cited as *J. Gerardi* Loisel. (1810) material from "North Carolina, *Curtis*, and Florida, *Ware* (*J. Floridanus*, Raf. in Hb. Durand)". This would seem to dispose of *J. floridanus*. It also gives the clue, that others of Rafinesque's *Junci* may have been in Durand's herbarium, now in Paris. Rafinesque's J. FUSCATUS, l. c. 194, from "Kentucky, Tennessee, &c", with "fl. quite peculiar", was earlier than *J. fuscatus* Turcz. ex Ledeb. (1853), the latter reduced by Buchenau to *J. triglumis* L. *J. fuscatus* Raf. is not clearly identified. So with his other names; they may rest undisturbed.

THE IDENTITY OF YUCCA FILAMENTOSA (PLATES 808 and 809). —*Yucca*, always a baffling genus to work with from herbarium material, has one species, *Y. filamentosa* L., which is reputed to follow much of the Coastal Plain from Louisiana to Florida and northward to North Carolina, with a related plant, *Y. concava* Haw. or *Y. filamentosa*, subforma *latifolia* Engelm., on coastwise sands from Georgia to New Jersey. The tendency has been to follow the conclusions of Engelmann in Trans. St. Louis Acad. Sci. iii. 17–54 (1873). In that study, treating *Y. filamentosa* as a complex species, some of the varieties native, others only in cultivation, Engelmann defined what he considered true *Y. filamentosa*, his forma *genuina*, with two subforms: "*a, angusti-*

folia", a plant with linear-lanceolate leaves gradually attenuate from the middle; and *b*, subforma *latifolia*, = *Y. concava* Haw., with broad and rigid lanceolate or spatulate leaves obtusely mucronate and cucullate at tip. He concluded that the brief diagnosis quoted by Linnaeus from Gronovius, "foliis lanceolatis acuminatis together with the Hab. Virginia, points to the narrow-leaved form of what I have described as the genuine plant, as the one he and Gronovius had in view. Of this and other forms numerous specimens and full notes have been obtained from Dr. Mellichamp, of South Carolina, on which the following descriptions are based." Engelmann then went on to discuss the "narrow-leaved form" and the "broad-leaved variety", which in his Latin account were both subordinate to his "*Forma genuina*". In 1880 Baker, Journ. Linn. Soc. Bot. xviii. 227, 228 (1880), split *Y. filamentosa* into ten varieties, many of them cultivated only, with the broad natural range, "*Regiones littorales Americae borealis a Maryland ad Floridam*", treating *Y. concava* Haworth as *Y. filamentosa*, "var. *Y. concava*" and not citing *Y. filamentosa*, forma *genuina*, subf. *latifolia* Engelm. under it. Subsequently, Trelease, Mo. Bot. Gard. 13th Ann. Rep. 46–49 (1902), accepting Engelmann's and Baker's divisions in the main, likewise made typical *Y. filamentosa* the plant with "Leaves 25–40 cm. wide, gradually acute, rather rigid . . . Capsules rather narrowly cylindric", this plant shown in a photograph (his pl. 8, fig. 1) with narrowly linear-lanceolate and long, attenuate leaves, while its capsule (his pl. 12, fig. 1) was shown as 4–5 cm. long. This plant, taken by Engelmann, Baker, Trelease and subsequent authors as true *Y. filamentosa*, was assigned the range: "West-central North Carolina to south-eastern South Carolina, Florida from Jacksonville to Tampa, and doubtless in the intervening country". The plant with shorter, broader, more oblong-oblanceolate to spatulate and, in maturity, harshly scabrous heavy leaves, the *Y. filamentosa*, forma *genuina*, subf. *latifolia* Engelm., was taken up as var. *concava* (Haworth) Baker and a good portrait of a growing plant given (Trelease, pl. 10), showing the very characteristic and short, lanceolate, broad leaves, this very distinct plant given a range from South Carolina and Georgia to Maryland.

It remained for Small, Man. 303 (1933) to see stronger differ-

ences. Still adhering to the plant with "Leaf-blades of a linear type, somewhat narrowed toward both ends, attenuate to the slender apical spine, flat" as *Y. filamentosa,* with the range "Fla. to Miss., Tenn. and N. C.", this plant with "petals broadly ovate, 4–5 cm. long: capsule 5–6 cm. long", he correctly recognized another species, as *Y. concava,* with "Leaf-blades spatulate, abruptly narrowed or rounded and concave at the base of the stout apical spine", the species occurring from "Ga. to Del." and having "sepals and petals usually broader" than in the former and the capsule only 4–5 cm. long, the seeds rounder.

Ever since our first trip together to Virginia, Long and I have become very familiar there with the plant we have regularly called *Yucca concava,* following the treatment of Small. It occurs back of the outer beaches and among the dunes, and in sandy fields, roadsides and dry pineland back from the coast at least 80 miles (to the easternmost border of Dinwiddie County). Baker's "*Regiones littorales*" tells only part of the story. Throughout all this region of eastern Virginia, thence northward, the plant is constant in foliage, flowers and fruit, the plant beautifully illustrated in Sims, Bot. Mag. xxiii. pl. 900 (1806) as *Y. filamentosa,* its habit shown by Trelease, l. c. pl. 10. In this plant (our PLATE 808) the flowers are 5–7 cm. long, the petals 2–3 cm. broad and rounded to the short acumination, the filaments spiculate-papillate in irregular lines, the style in anthesis about 1 cm. long, the capsule thick-cylindric to short-ovoid, inclined to be constricted at or near the middle and dumbbell-like, 1.5–4.5 cm. long; the semiorbicular seeds 6–7 mm. long by 3–5.5 mm. broad.

In *Yucca filamentosa* sensu Engelmann, Baker, Trelease and others, including Small, who seems first to have recognized the best specific characters, the southern plant (our PLATE 809) with linear-lanceolate long-tapering leaves, the flowers are only 3–5 cm. long, the petals 1–2 cm. broad and tapering to gradually acuminate tips, the filaments nearly pilose with elongate trichomes (especially at base), the style at flowering time nearly obsolete or up to only 5 mm. long, the more uniformly subterete capsule 4–6 cm. long.

When Engelmann assumed, because he had material from South Carolina of the latter plant, that it must, therefore, be the

Virginian plant, "In littoribus arenosis fluminum crescit", of Clayton, which is the type of *Yucca filamentosa* L., he was at least naïve. Not all plants of South Carolina and Virginia are identical. In exploring the southeastern counties of Virginia Mr. Long and I have often noticed that farmers frequently set young plants of their native *Yucca* along roadways and in sandy clearings. Our driver for some seasons, a farmer of keen intelligence, Leonard Birdsall, explained that they harvest the hard leaves as "Silkgrass", and after macerating them and softening the tissue, remove the strong threads for use in tying bunched vegetables. This plant, *Y. concava,* being the abundant and, so far as we know, the only native species of the genus in eastern Virginia, it is not surprising that the specimen preserved at the British Museum (photograph sent by Dr. Ramsbottom) should show the characteristic flowers (plate 808, fig. 1)—the two smallish ones at the tips of branches—of typical *Y. concava,* nor that Clayton's no. 720 (miscopied by Gronovius as 270), the type of *Y. filamentosa,* should have been labeled by him: "Yucca flore albo, foliorum marginibus fllamentosis. **Silkgrass.**"

The type of *Yucca filamentosa* L. Sp. Pl. 319 (1753) being the relatively northern *Y. concava,* it is necessary to find the proper specific name for *Y. filamentosa* sensu Small, the *Y. filamentosa,* forma *genuina,* subf. *angustifolia* of Engelmann. Study of the bibliographies of Engelmann, Baker and Trelease yielding none, I venture to name the narrow- and smoother-leaved southern plant for the botanist who first saw its specific differences. It is a pleasure so to do; it is not always that I can follow him. I am calling it

Yucca **Smalliana,** sp. nov. *Y. filamentosa* sensu Small, Man. Se. Fl. 303 (1933), not L. *Y. filamentosa,* forma *genuina,* subf. *angustifolia* Engelm. in Trans. St. Louis Acad. Sci. iii. 51 (1873), not *Y. angustifolia* Pursh (1814). Type: sandy soil near Jacksonville, Florida, May, *A. H. Curtiss,* no. 2950, in Herb. Gray. Plate 809.

Although Small states that the smaller-flowered and more southern *Yucca Smalliana* (*Y. filamentosa* sensu Small, not L.) has "panicle-branches glabrous", the material before me shows them merely glabrescent. At flowering time they are pruinose-pilose, only in fruit becoming glabrate. True northern *Y. filamentosa* has the panicle glabrous from the first. In its pubescent

panicle *Y. Smalliana* suggests the upland *Y. flaccida* Haw., of the Blue Ridge and adjacent uplands, which may have pubescent or glabrescent panicle; but, as I understand it, *Y. flaccida* has very pliable and thin leaves, very broad and abruptly short-acuminate petals (as shown in Lindl. Bot. Reg. xx. t. 1895 (1836)), and the native specimens which seem to belong to it have the style elongate and the broad and flat filaments coarsely ciliate. In *Y. Smalliana* (PL. 809) the flower is smaller, with much narrower and acuminate sepals and petals, the style obsolete or very short, and the filaments less flattened and finely pruinose-pilose.

PLATE 808 is of YUCCA FILAMENTOSA L.: FIG. 1, terminal flowers, × 1, from the TYPE (from photograph sent by Dr. *John Ramsbottom*); FIG. 2, characteristic leaves, × ½, from Old Town Neck, Northampton County, Virginia, *Fernald, Long & Fogg*, no. 5269; FIGS. 3 and 4, flowers, × 1, from Cape Henry, Virginia, *Fernald, Griscom & Long*, no. 4707; FIG. 5, ovary, style and filaments, × 3, from no. 4707; FIG. 6, ripe capsules, × 1, from south of South Quay, Virginia, *Fernald & Long*, no. 10,585.

PLATE 809, YUCCA SMALLIANA Fernald: FIG. 1, leaves and flowers, × ½, from TYPE; FIG. 2, basal rosette, greatly reduced, from Florida, photo. by *A. H. Curtiss*, 1887; FIGS. 3 and 4, flowers, × 1, from TYPE; FIG. 5, ovary, style and filaments, × 3, from TYPE; FIG. 6, capsule, × 1, from Florida, *A. H. Curtiss.*

SPECIFIC DISTINCTIONS BETWEEN POLYGONATUM BIFLORUM AND P. CANALICULATUM.—More than a decade ago, while studying with me, Dr. W. A. Anderson, Jr. clearly worked out the proper nomenclature and the specific characters of our American species of *Polygonatum* and, although he published[1] his study of *Trillium* in Tennessee, he has, unfortunately, not stated in print his conclusions regarding *Polygonatum.* In the Manual range we have three indigenous species, *P. pubescens* (Willd.) Pursh, quickly distinguished by having superficial rhizomes, minutely pilose or hirtellous lower leaf-surfaces, lowest peduncle usually from the 1st or 2nd leaf-axil, perianth 7–13 mm. long, with stamens inserted high on the tube; and *P. biflorum* (Walt.) Ell. and *P. canaliculatum* (Muhl.) Pursh (*P. commutatum* (R. & S.) Dietr. and *P. giganteum* Dietr.), formerly needlessly confused and, judging from recent identifications, not usually understood, two very different species with deep-seated rhizomes, glabrous lower leaf-surfaces, lowest peduncle usually from the 3d–5th leaf-axil, perianth 1–2 cm. long, stamens inserted near middle of

[1] W. A. Anderson, Notes on the Flora of Tennessee: the Genus Trillium. RHODORA, xxxvi. 119–128 (1934).

the tube. Dr. Anderson, with the collaboration of Mr. C. A. Weatherby, found so many distinctive characters and in my own detailed study so many others become evident that it may be helpful to others to have these distinctions pointed out. The usual failure clearly to separate the two species, *P. biflorum* and *P. canaliculatum*, is reflected in many recent local floras. Thus Wiegand & Eames in their very helpful and usually keenly discriminating Flora of the Cayuga Lake Basin give two types of habitats for their inclusive *P. biflorum:* "Sandy or gravelly, rarely clayey, banks and thickets, in subneutral soil, on dry hillsides and hilltops, or in alluvial calcareous soils on river banks". Several of the collections cited by them are represented in the Gray Herbarium. Those from "Sandy or gravelly . . . banks", etc. are characteristic *P. biflorum:* "dry ravine bank, between Renovick and McKinney's", etc., these plants having the characteristic slender rhizome, slender stem only 6–7 dm. high, flat and relatively few-nerved, merely sessile leaves, lowest peduncle from the 3d leaf-axil and 1.2–2 cm. long, with the 2 or 3 pedicels 0.5–1.4 cm. long, and slender perianth with lobes 3.5 mm. long. The material from "alluvial calcareous soils" is characteristic *P. canaliculatum:* "Valley of Inlet, Ithaca", etc., the plants with rhizome more than 2 cm. thick, stout stem (1 cm. thick) 2 m. high, with clasping-based corrugated and undulate-margined leaves with about 200 nerves, the flowering peduncles up to 9 cm. long, with 4–7 pedicels up to 2.5 cm. long, the thicker perianth with lobes 6 mm. long. Again, in that compendium of accurate local field-observation, Deam's Flora of Indiana, the author, beautifully distinguishing the pubescent-leaved *P. pubescens*, with superficial rhizome, from the glabrous-leaved plants with deep-seated rhizomes, which he unwillingly treated as one species, *P. biflorum*, wrote: "My study of this species complex was made from 155 specimens which I have collected from all parts of the state. I am not satisfied with the treatment of this species but I am not able to find differences sufficient to separate them . . . I do not think them all the same species . . . The genus has been monographed by three authors and my specimens have been seen by one of them but I cannot accept their treatment of this complex." Such observations indicate the need of better statements of the char-

Photo. B. G. Schubert.

Yucca filamentosa: fig. 1, flowers, × 1, from type; fig. 2, leaves, × ½; figs. 3 and 4, flowers, × 1; fig. 5, ovary, style and filaments, × 5; fig. 6, capsules, × 1

Photo. B. G. Schubert.

Yucca Smalliana: fig. 1, leaves and flowers, × ½, from type; fig. 2, basal rosette, greatly reduced; figs. 3 and 4, flowers, × 1, from type; fig. 5, ovary, style and filaments, × 3; fig. 6, capsule, × 1

acters, and the misidentifications in the herbaria (including our recent collections from Virginia as identified by a student of the group) also indicate such a need.

Very briefly my conclusions follow:

Polygonatum biflorum (Walt.) Ell. Rhizome 0.6–1.5 cm. thick; stem slender, 1.5–5 mm. thick below lowest leaf, 2–9 dm. high; leaves flat, sessile or nearly so, narrowly lanceolate to broadly ovate, the largest ones (of each plant) with 46–120 nerves and 5.5–15 cm. long by 1.2–6 cm. broad, the terminal small ones 20–66-nerved; peduncles 1–4 cm. long, 1–3 (–5)-flowered, the lowest usually borne from the 3d (1st–5th) axil; pedicels becoming 0.5–2 cm. long; perianth slenderly cylindric, 1–1.7 cm. long, its lobes 3–4 mm. long; filaments commonly papillate or granulose, slender; enlarged terminal joint of fruiting pedicel cupshaped or campanulate, with the rim flaring, 0.7–1.5 mm. long, often as broad; seeds 2.7–3.5 mm. long.—Dry to moist, sandy, loamy or rocky woods and thickets, Florida to Texas, north to Connecticut, New York, southern Ontario, southern Michigan, Illinois, Iowa and Nebraska.

P. canaliculatum (Muhl.) Pursh. Rhizome 1.5–3 cm. thick; stem stout, 0.5–1.3 cm. thick at lowest leaves, 0.6–2 m. high; leaves more or less corrugated and with puckered margin (not drying flat), mostly narrowed to broad clasping or sheathing subpetiolar bases, the larger ones with 110–220 nerves and 0.9–2.5 dm. long by 3.5–13 cm. broad, the smallest terminal ones 58–112-nerved; peduncles becoming 1.5–9 cm. long, 2–10-flowered, the lowest commonly borne from the 4th or 5th (3rd–8th) axil; perianth thick-cylindric, 1.7–2 cm. long, its lobes 5–6.5 mm. long; filaments broad, smooth or merely granulose; enlarged terminal joint of fruiting pedicel subcylindric to slenderly campanulate (except at flaring summit), 1–3 mm. long, usually longer than thick; seeds 3–4.5 mm. long.—Rich woods, alluvial thickets, river-silts and other calcareous habitats, Connecticut Valley of New Hampshire to southern Manitoba, south to South Carolina, Tennessee, Missouri and Oklahoma.

Many reputed species and varieties have been proposed, based upon shade of color, breadth of leaf, etc. These I am not here discussing. That is for a monographer who has studied them all. So far as I have seen they do not affect the fundamental specific characters of the species long ago defined. In fact, I have recently been challenged to point out any *real* characters distinguishing *P. canaliculatum* from *P. biflorum*. The above is my answer. What better characters could be found in the *Liliaceae?*

The position of the lowest peduncle, a splendid character pointed out by Deam, is certainly significant. I have noted its position in all specimens in the Gray Herbarium and that of the New England Botanical Club. The results follow.

P. PUBESCENS: of 365 plants 100 (27+ per cent.) have the lowest peduncle from the 1st axil, 241 (66+ per cent.) from the 2nd, 20 from the 3rd and only 1 from the 4th.

P. BIFLORUM: of 116 plants 3 have the lowest peduncle from the 1st axil, 12 (10 per cent.) from the 2nd, 68 (59+ per cent.) from the 3rd, 28 (24+ per cent.) from the 4th, and 5 from the 5th.

P. CANALICULATUM: of 41 specimens 4 (10 per cent.) have the lowest peduncle from the 3rd axil, 17 (41+ per cent.) from the 4th, 13 (31+ per cent.) from the 5th, 1 from the 6th, 2 from the 7th, and 1 from the 8th.

A biologically interesting form, because flowering from elongate leafy axillary branches, of *Polygonatum biflorum* is

P. BIFLORUM, forma **ramosum** (McGivney), comb. nov. *P. commutatum*, forma *ramosum* McGivney in Am. Midl. Nat. ix. 664, fig. (1925).

THE INDIGENOUS ALLEGHENIAN CONVALLARIA.—The native Lily-of-the-Valley, occurring in acid rocky or sandy woods, summits and upper ravines of the mountains from Virginia and eastern West Virginia to northern Georgia and eastern Tennessee, is much larger than the European *Convallaria majalis* L., the plant so generally cultivated and naturalized near settlements; and, as Professor Massey writes me, no one knowing its stations high on the mountains would think of calling it "of the Valley." In the European species the scape is elongate, so that the flowers are borne opposite the middle or upper halves of the leaves; the leafy axis (to the base of the upper leaf) is, except in highly cultivated plants, 5–12 cm. high, with the larger leaves 1–2 dm. long and 3–7.5 cm. broad, their veins and cross-partitions, as seen by transmitted light, relatively faint and pale; the longer bracts of the raceme are lanceolate, 4–10 mm. long, and much shorter than the pedicels; and the seeds are nearly globose. In the native eastern American species the scape and raceme are shorter than the leafy axis or barely reaching the lower half of the lowest leaf; the leafy axis is 1.5–2 dm. high, with the larger clear green (not glaucescent) leaves 1.5–3 dm. long and 4–12 cm. broad, strongly nerved, the dark nerves and cross-partitions sharply visible by transmitted light; the longest bracts of the

raceme are almost linear, 0.8–2 cm. long and nearly equaling to much exceeding the pedicels; and the seeds are compressed, either oblate or somewhat lenticular.

In recent years the Alleghenian native has been known as *Convallaria majuscula* Greene in Fedde, Rep. Nov. Spec. v. 46 (1908). Greene proposed two species, *C. globosa*, l. c., a plant cultivated by the late Robert Ridgway who received it from a dealer as found in the mountains of North Carolina, and *C. majuscula*, "occasionally collected in the higher mountains of V i r g i n i a, from the Peaks of Otter northward; also in those of southeastern P e n n s y l v a n i a. . . . it differs totally from that [*C. majalis*] in its very large light-green leaves without trace of bloom, with excessively fibrous anatomy, insomuch that the surface of the leaf when growing looks to be plicate rather than plane and even. Both these American species . . . when compared with *C. majalis*, flower much later, their foliage perishing at the end of summer." There are no evident specific characters separating the cultivated *C. globosa* and the indigenous plant of western Virginia, therefore the name *C. majuscula* has come into use.

There is, however, a perfectly available name for the native plant, which was well described 68 years before Greene's publication. This is *Convallaria montana* Raf. Aut. Bot. 66 (1840). Rafinesque's account, quite as good as Greene's, was as follows:

> 486, *Conval, montana* Raf. (pseudlo-majalis Bartr. in Rees cycl. Am. ed.) fol. binis sessilib. ovatobl. acum. scapo angul. fol. subeq. racemo 10–12 floris, bract. lanc. ad ped. eq. fl. secundis—Unaka and Cherokis Mts. large plant, leaves 6 to 8 inches long, 2 wide, fl. size of C. majalis. Bartram says the berries are blue and ovate. C. majalis has leaves petiolate elliptic acute at both ends, raceme of 7–8 fl. bracts half length of pedicels.

Rafinesque had, also, a *Convallaria parviflora*, l. c. with "scapo filif. fol. brevior." etc., from "Appalachian and Wasioto Mts." Whether this was small-flowered *C. montana* or the introduced plant I do not feel certain, but the identity of *C. montana* and *C. majuscula* can hardly be questioned.

From Rafinesque's reference to Bartram it would appear that the latter had still earlier given the correct name to our native *Convallaria*. In Rees Cycl. Am. ed. x. (1810 or later), after the original British treatment there occurs the following unsigned and bracketed note:

[To these we will add, from Bartram, *C. pseudo-majalis*, mountain lilly of the valley. This charming plant is indigenous to the mountainous parts of the United States of America, particularly the country of the Cherokees, in the rich glades or shady vallies in their mountains, and in the like situations in Pennsylvania. It differs but little from C. majalis of Europe, only is larger every way, and the fruit blue and more oblong to ovate.]

Here, of course, was where Rafinesque got his quotation from Bartram about the blue berries. In his Travels (1791) Bartram repeatedly noted *Convallaria majalis* from the upper slopes of the Cherokee country but I have been unable to find him giving in print a new name or noting the "blue" berries. Since *C. montana* (or *C. majuscula*) has, as I am assured by Professor Massey and others who are familiar with it in the wild, RED berries we can hardly accept *C. pseudo-majalis* as properly diagnosed. Bartram could quite as well have had *Polygonatum!* The synonymy of our native species is as follows:

CONVALLARIA MONTANA Raf. Aut. Bot. 66 (1840), excluding the synonym *C. pseudo-majalis* Bartr. ex Rees Cycl. Am. ed. x (1810 or later) as too doubtful on account of the blue fruit. ?*C. parviflora* Raf. l. c. (1840). *C. globosa* Greene in Fedde, Rep. Nov. Spec. v. 46 (1908). *C. majuscula* Greene, l. c. (1908); Fernald in RHODORA, xxx. 184, foot-note (1928) and xxxix. 347, foot-note (1937).

TRILLIUM CATESBAEI AND T. NERVOSUM Ell. (PLATES 810 and 811).—Elliott, Sk. i. 429 (1917), described two new species, *Trillium Catesbaei* and *T. nervosum.* The first, which he took to be the same as the plant illustrated by Catesby, Nat. Hist. Carol. etc., i. t. 45, as *Solanum triphyllon; flore hexapetalo, carneo* (our PLATE 810, FIG. 1) was described as follows

8. CATESBAEI. E.

T. pedunculo recurvato; petalis lanceolatis, calyce majoribus; foliis obovatis ovalibusque, acuminatis, basi attenuatis. E.	Peduncle recurved; petals lanceolate, larger than the calyx; leaves obovate and oval, acuminate, tapering at base.

Catesby, Carol. p. 45, t. 45.
T. cernuum, Michx. 1. p. 216?

Leaves 4–6 inches long, rather obovate, 3 inches wide, tapering to the base and not abruptly acuminate at the summit. *Petals* lanceolate, expanding, undulate, rose coloured. Leaves of the *calyx* long, narrow.

[Then a paragraph of more or less pertinent observation, with the conclusion that his plant, coming from the same region as Catesby's, must be identical.]

Pendelton county, South-Carolina; Mesrs. Baker & Perry.

The second of these new species (our PLATE 810, FIG. 2) was

9. NERVOSUM. E.

T. pedunculo recurvato; petalis oblongo-lanceolatis, calyce majoribus; foliis lanceolatis ovatisque, utrinque acutis, membranaceis, nervosis. E.	Peduncle recurved; petals oblong lanceolate, larger than the calyx; leaves lanceolate and ovate, acute at each end, membranaceous, nerved.

Plant 6–8 inches high. *Leaves* generally narrower than those of the *T. sessile*, most commonly lanceolate, membranaceous, somewhat 3 nerved. *Peduncles* about an inch long. *Petals* rose coloured.

Grows in the upper and middle country of Georgia and Carolina. Athens; Mr. Green. The T. cernuum of Walter probably belongs to this species.

Now, if anything is clear, it is that the plants which Elliott was describing differed strikingly as follows: *T. Catesbaei* with "rather obovate" leaves 3 inches broad, *T. nervosum* with them lanceolate and ovate ("most commonly lanceolate") tapering at both ends.

Most fortunately, Elliott's Herbarium, which, in the past suffered serious destruction by insects, mould and the removal of specimens, still contains these two types in good condition. They were photographed in October, 1941, by Mr. and Mrs. Weatherby, their photographs (our PLATE 810) now in the Gray Herbarium. Although it is, as said, most fortunate that the types exist and closely agree with Elliott's descriptions, it is most unfortunate that Elliott identified his plant with obovate-oval broad leaves with Catesby's plate and, consequently, called this species *T. Catesbaei*. The type of *T. Catesbaei* has elongate, curving stigmas sessile at the summit of the ovary, while its petals are pretty broad to be called lanceolate. The type of the narrow- and tapering-leaved *T. nervosum* has a definite style capping the ovary (PLATE 810, FIG. 2). In other words, the type of *T. nervosum* is identifiable with *T. stylosum* Nutt. Now, if Catesby's plate be examined it will be seen (our PLATE 811) that the leaves are those of *T. nervosum* and that, in the Catesby drawing of the fruit (our FIG. 2) there is a definite style. Elliott evidently "got the wires crossed" and identified the Catesby plate with the wrong plant; and Rendle, Journ. Bot. xxxix. 333 (1901), said "In the absence of the specimens which Elliott had before him, Catesby's figure (which he cites) is the only authority for this species." He, therefore, took up *T. Catesbaei* for the

narrow-leaved plant with definite style as impressionistically shown in Catesby's plate (impressionistically, because Catesby had the sepals beautifully roseate and petaloid, just like the petals!) and a plant of the Carolina mountains with broadly rhombic leaves he described and illustrated as *T. Rugelii* Rendle in Journ. Bot. xxxix. 381, t. 426 B (1901). Rendle's illustration shows broadly rhombic leaves 11.5 cm. wide; material from the same general region, Highlands, North Carolina, April, 1903, *Harbison*, has them less broadly tapering at base, tending to obovate and 6–9.5 cm. broad; Harper's no. 1891 from Randolph County, Georgia, generally identified with *T. Rugelii*, has them in outline nearly as in the type of *T. Catesbaei* and 9–12 cm. broad; and Harper's no. 3492 from Tuscaloosa County, Alabama, has them definitely rhombic-obovate and 7.5 cm. broad; while the type of *T. Catesbaei* has them 9–10 cm. broad. All these, as I understand the plants, show the usual range of variation in the leaves and are all T. CATESBAEI Ell. (1817). They are also *T. Rugelii* Rendle (1901), for, since "the absence of the specimens which Elliott had before him" is now rectified by looking in Elliott's Herbarium at Charleston, not in the British Museum, the identity of *T. Catesbaei* has become clarified.

Early Carolina botanists clearly recognized that *T. nervosum* Ell. (1817) was the same as *T. stylosum* Nutt. (1818) and many sheets from M. A. Curtis had both names (often bracketed) on their labels. They were right. The error occurred when *T. nervosum* was dropped (as by Small) and *T. Catesbaei* (following the gratuitous assumption of Rendle) was wrongly used in the sense of *T. stylosum*.

In PLATE 810, FIG. 1 is the TYPE of TRILLIUM CATESBAEI Elliott, × 1, after a photograph by *C. A. and Una F. Weatherby*. FIGS. 2 and 3, T. NERVOSUM Ell.: FIG. 2, the TYPE-SHEET × ½, after a photograph by *C. A. and Una F. Weatherby;* FIG. 3, detail of flower in central specimen of fig. 2, to show style, × 3.

PLATE 811, FIGS. 1 and 2, portions of Catesby's plate of *Solanum triphyllon; flore hexapetalo, carneo,* Nat. Hist. Carol. i. t. 45: FIG. 1, flowering summit, × 1; FIG. 2, fruit, showing style, × 1. FIG. 3, leaf, × 1, of TYPE of SMILAX BONA-NOX L., var. EXAURICULATA Fernald.

TRILLIUM FLEXIPES Raf. Aut. Bot. 133 (1840). *T. erectum,* var. *declinatum* Gray, Man. ed. 5: 523 (1867). *T. declinatum* (Gray) Gleason in Bull. Torr. Bot. Cl. xxxiii. 389 (1906), not Raf. Aut. Bot. 135 (1840). *T. Gleasoni* Fernald in RHODORA, xxxiv. 21 (1932).

Rafinesque's description of *Trillium flexipes* was unusually good, for him:

968, *Tril. A* [i. e. his subgenus *Anthopium*, with peduncled flowers and sessile stigmas] *flexipes* Raf. caule sulcato, fol. sessil. obovatis acuminatis undul. 3nervis, pedunc. equante inclinato flexuoso, calix lanceol. acum. petalis albis eq. obl. acut. undul.—West Kentucky and Tennessee, rare, pedal, leaves 3 inches long, 2 broad, flowers middle size.

The inclined peduncle about equaling (in early anthesis) the sessile, acuminate, obovate leaves, the acuminate, lanceolate sepals and the equal, oblong white petals are all good characters of *Trillium Gleasoni*. That it occurs in western Kentucky there can be no question. Witness *Shacklette*, no. 378 from Union County, Kentucky. Wiegand & Eames, in their study of the group, cited it from Tennessee in Rhodora, xxv. 190 (1923) as did Small (Man.); and it occurs in eastern Missouri. There is no reasonable doubt about *T. flexipes*. The form with maroon or purple petals is

Forma **Walpolei** (Farw.), comb. nov. *T. cernuum*, var. *declinatum*, forma *Walpolei* Farw. in Rep. Mich. Acad. Sci. xxi. 363 (1920).

T. declinatum Raf. l. c. 135 (1840) and T. balduinianum Raf. l. c. 135 (1840) are probably both forms of T. nervosum Ell.

T. lancifolium Raf. l. c. 132 (1840) can hardly be anything but *T. recurvatum*, var.(?) *lanceolatum* (Boykin) S. Wats. in Proc. Am. Acad. xiv. 273 (1879), based upon T. lanceolatum Boykin in herb. in Wats. l. c. 274 (1879). Watson treated *T. lanceolatum* as a doubtful variety of the northern and wide-ranging *T. recurvatum* Beck, but, as Small, Bull. Torr. Bot. Cl. xxiv. 171 and 174 (1897), showed, the two are well distinguished species. Small (Man.) gives the range of *T. lanceolatum* as "W. Fla. to La., Tenn. and Ga." and in Rhodora, xlv. plate 773, fig. 3 (1943), I showed, life-size, the summit of a characteristic plant, × 1, from northwestern Florida, the original specimen 11 inches high. If Rafinesque's description be compared with this figure the identity of *T. lanceolatum* Boykin (1879) and *T. lancifolium* Raf. (1840) will be apparent:

962, *Tril. S.* [subgenus *Sessilium*] *lancifolium* Raf. caule elato, fol. sess. lanceol. acutis trinervis patulis planis sepe maculatis, calicib. patulis vel reflexis, petalis erectis longior rubris unguic. lanceol.—Florida to Alabama and Apalachian Mts. stem often pedal leaves 3 inches, flowers uncial.

As to "flowers uncial.", the petals vary from 1.5–4.5 cm. long, the lower measurement being less than "uncial."

We do not know true *Trillium lancifolium* (*T. lanceolatum*) in the Gray's Manual area, although Rendle, Journ. Bot. xxxix. 327 (1901), referred to "Specimens which I have seen from Kentucky (*Short*)". The specimens which are in American herbaria, accompanied by Short's label with the print, "C. W. SHORT, *M.D.* KENTUCKY, 1840" fortunately bear, in his hand, the written memorandum, "From Dr. Boykin, Ga.". In other words, they are isotypes of Boykin's species.

T. CUNEATUM Raf. Aut. Bot. 133 (1840). *T. Hugeri* Small, Fl. Se. U. S. 277 and 1328 (1903).

Trillium cuneatum was thus described:

964, *Tril. S.* [subgenus *Sessilium*] *cuneatum* Raf. caule elato, fol. sessilib. ovatobl. acutis trinervis planis concolor, calicib. erectis obl. petalis cuneatis duplo longior acutis purpurascens.—Unaka Mts. of Cherokis, pedal leaves 3 inches, flowers large akin to those of Tr. maculatum, but leaves very different.

It is most difficult to believe that Rafinesque's plant from the Cherokee country, with ovate-oblong acute green leaves, oblong sepals and cuneate purplish petals twice as long as the sepals is not the characteristic large-flowered *T. Hugeri* (type from Tryon Mt., North Carolina), which abounds in the Appalachian region from northwestern Florida and Alabama northward to North Carolina and Kentucky. Rafinesque compared it with his earlier published *T. maculatum*, "of the coastal plain and piedmont regions from the Carolinas to Alabama and Mississippi", with, further, to quote Dr. W. A. Anderson in RHODORA, xxxvi. 122, 123 (1934), "leaves . . . lance-ovate, . . . strongly mottled, mottling tending to form longitudinal stripes; sepals 2.5–5 cm. long. . . , lanceolate, acute; petals 3.5–6 cm. long". Anderson, identifying T. MACULATUM Raf. (1830) with *T. Underwoodii* Small (1897), said "Among the numerous species of *Trillium* described by Rafinesque, this one is unmistakable".

By Small (Man.) his Coastal Plain *Trillium Underwoodii* (*T. maculatum* Raf.) is, in the key, separated from his montane *T. Hugeri* (*T. cuneatum* Raf.) by its narrower leaves ("bracts"), in the former "much longer than wide, often twice as long", in the

Photo B. G. Schubert.

TRILLIUM CATESBAEI: FIG. 1, TYPE, × 1, after photograph by *C. A. and Una F. Weatherby*
TRILLIUM NERVOSUM: FIG. 2, TYPE-SHEET, × ½, after photograph by *C. A. and Una F. Weatherby;* FIG. 3, detail, to show style, × 3

Photo. B. G. Schubert.

TRILLIUM NERVOSUM: FIGS. 1 and 2, portions, × 1, of Catesby's plate of *Solanum triphyllon; flore hexapetalo carneo*
SMILAX BONA-NOX, var. EXAURICULATA: FIG. 3, leaf, × 1, from TYPE

latter "nearly or quite as wide as long". From the type-locality and the description *T. cuneatum* well matches the more oblong-ovate-leaved extreme of the Appalachian *T. Hugeri*, originally described by Small with "blades . . . bright green [Raf. said 'concolor'] . . . , sepals oblong to oblong-lanceolate [Raf. said 'obl.'], . . . petals oblong-lanceolate to spatulate, purple, somewhat longer than the sepals [Raf. said 'cuneatis duplo longior . . . purpurascens']."

Rafinesque had no less than 34 so-called species and 67 so-called varieties[1] of *Trillium*. A few species, as noted above, were described with sufficient clarity to be recognizable. In these cases his names, when having priority, are automatically taken up. *T. flexipes* Raf. thus displaces *T. Gleasoni* Fernald, *T. lancifolium* Raf. throws out *T. lanceolatum* (Boykin) S. Watson, *T. cuneatum* Raf. antedates *T. Hugeri* Small, and *T. maculatum* Raf. replaces *T. Underwoodii* Small. Most of the others are too vague for recognition, others are definite renamings of already properly published species, often with mere undefined varietal names: for instance, *T. rotundifolium* Raf., with a brief description which is applicable to *T. erectum* L., and "Var. 1. *Flexicaule*. 2. *Rubricaule*. 3. *Maculatum*. 4. *Orbiculatum*. 5. *Pallidum*. 6. *Undulatum*." These six varietal names are, of course, *nomina nuda* and have no status; their publication does not indicate a sound mentality or genius as a phytographer. Nevertheless, although (his p. xxi) acknowledging what any clear thinker quickly sees, that "Rafinesque's genius is debatable in the extreme", that "unbalanced . . . he may have been" (his p. 166) and (his p. 263) that "A Dr. Faustus, dangerously experimenting, tempting the rack or devil-ridden madness, would certainly correspond in a crude way to Rafinesque", one of the few monographers of *Trillium*, Mr. Donald Culross Peattie, becomes ebullient over this erratic and "unbalanced" man, whom, nevertheless, he considers "one of the most prodigious and prophetic scientists of the century 1750 to 1850" (his p. 261)—the century, to mention a few botanists only, of Haller, Linnaeus, Lamarck, Humboldt, Robert Brown, DeCandolle, Darwin, young Gray and his friend, young Joseph Hooker, and

[1] Dr. Merrill calls my attention to the fact that Rafinesque, with 67 varieties in *Trillium*, set a score not achieved by the much advertised Heinz's "57 varieties".

countless others for whom no one has the "nerve" to apologize and who were respected by every one for sanity, clarity and sound scholarship. Peattie, over-enthusiasitc about the "prophetic" nature of Rafinesque's unbalanced work, wrote (Green Laurels, p. 266): "If the rules of priority were strictly and justly applied, Rafinesque would be found to have antedated a large part of the work . . . in botany of Gray and DeCandolle". Whew! Rafinesque himself might well have written such a sentence; his introverted brain (likewise that of Marcus Jones) frequently brought forth just such statements.

But, returning to *Trillium.* One of the few monographic studies of *Trillium* is that of Peattie, *Trillium in North and South Carolina*, in Journ. Elisha Mitchell Soc. xlii. 192–206 (1927) and, as an outgrowth of this, the treatment of the genus in Small's Manual (1933). In the former treatment we read (p. 193): "Following Asa Gray, who eschewed anything from Rafinesque's pen, Sereno Watson[1] . . . reduced to synonymy or varietal rank the greater part of Rafinesque's . . . names of *Trillium.* It was not until Small showed the limited nature of *T. sessile* L. and set off *T. Underwoodii* and later *T. Hugeri* that our knowledge of the genus drifted out of the doldrums into which workers like Watson [whose great genius and just fame need no defense], with almost no field knowledge, had put us". In view of Peattie's evaluation of the work of Rafinesque it is, consequently, amazing that he so consistently ignored his 34 species and 67 varieties of *Trillium*, many of them described from the Carolinas or other Southern States, and that he failed to welcome the opportunity to displace *T. Hugeri* and *T. Underwoodii* of Small by Rafinesque's names of 1840 and 1830 respectively.

[1] Peattie seems to overlook the patent fact that both Asa Gray and his friend Alphonse DeCandolle (dim lights, one gathers, as compared with his hero) regularly took up Rafinesque's genera and species when they were definite and had priority: *Peltandra* Raf., including *P. undulata* and *P. alba* Raf. *Clintonia* Raf., with the species *C. borealis* Raf.; *Hexalectris* Raf., with the species *H. aphylla* Raf.; *Adlumia* Raf., with the species *A. cirrhosa* Raf.; and so on with scores of other genera. This was far from "eschewing" his work, when sound. It was not the fault of either DeCandolle or Gray that the great majority of Rafinesque's genera and species had been earlier described or were so vague as to be undecipherable. Neither is it through the "prejudice" imagined by Peattie that earlier specific names have been taken up in Rafinesque's genera *Peltandra, Hexalectris, Adlumia, Cladrastis, Nemopanthus, Osmorhiza*, etc., nor that later monographers have discarded his genera *Didiplis, Steironema, Ilysanthes*, etc. Koehne, Handel-Mazzetti and Pennell, who made these generic reductions, had no "prejudice" against Rafinesque's work, when understandable. Dramatic and unfounded statements have no place in real science; they belong in fiction.

If anyone has "eschewed anything from Rafinesque" it is the author of a recent monograph who has ignored all but 4 (scarcely 4 per cent) of Rafinesque's published names in the genus—these all reduced by the admirer of that "prophet" to synonymy.

(*To be continued*)

LILIUM SUPERBUM AND OTHER ISOLATED SPECIES IN DURHAM, NEW HAMPSHIRE

A. R. Hodgdon

An intensive program of botanizing in the immediate vicinity of the University of New Hampshire, in part compelled by the recent restrictions on "pleasure" driving, has yielded results of some interest. It shows, for example, that the area around Great Bay and within a few miles of York County, Maine, may be expected on further botanizing, to yield some of the well known and considerably publicized varieties of that area as well as a group of quite unique isolated species of its own. Recent discoveries in the vicinity of tidewater Durham are here reported as significant range extensions.

One morning in late July, 1942, at Jackson's Landing on the northern shore of the Oyster river and within a mile of the campus of the University of New Hampshire, I had been pointing out to my class some of the interesting features of salt marshes. My eye suddenly was attracted to what appeared to be premature autumn leaves—a splash of red in a thicket about 200 feet away at the upper edge of the marsh. The "autumn leaves" proved to be a gorgeous clump (more than a dozen stems) of *Lilium superbum*, here from seventy to a hundred miles north of the stations in Plymouth, Bristol, and Barnstable counties in Massachusetts, where this species seems to be thoroughly indigenous.

The type of situation—margin of a salt marsh[1] backed by a thicket and remote from a habitation—suggests that the plant is native in Durham. Certainly, no one planted the lily there to

[1] The specimen at the Gray Herbarium from West Dennis, *Fernald and Long* no 16575, was collected at the edge of a salt marsh. However, of its habitat-preference, Professor Fernald, in a letter to me of August 26, 1943, writes. "Although the species wanders into brackish meadows it is most often in acid peat . . ."

"blush unseen". On the other hand, were the lily shown to be an escape into this setting, the record would seemingly lose little of its significance. At least one published record shows the lily to be, probably, not native, but to have persisted and become naturalized in northern Massachusetts. E. J. Palmer thus includes *Lilium superbum* in "The Spontaneous Flora of the Arnold Arboretum".[1] Of this occurrence, Palmer[2] describes the plant as "locally abundant in low meadow, near Administration Building and occasionally found in other parts of the Arboretum. It is said to have been planted in the meadow and perhaps is entirely introduced."

Additional support for my contention that the Durham lily is thoroughly native is supplied by the isolated occurrences of several other rare species in the area about Great Bay. For example, at Adams Point, which projects into Great Bay in the southern part of Durham township, I was fortunate enough in September, 1938, to discover a colony of *Iva frutescens* var. *oraria.* This is the first reported colony in the United States from north of Massachusetts. A. E. Roland[3] has, however, reported this species from Hortonville, King's County, Nova Scotia. Further search nearby disclosed *Ceanothus americanus* growing in a heavy clay soil and *Cornus florida* flourishing on cliffs of quartzite. Both species are decidedly spotty in distribution here, many miles from any other known stations, though in both cases colonies are known farther to the north. Specimens of *Ceanothus americanus* in the herbarium of the New England Botanical Club show that the nearest known colonies are in the Merrimack Valley of New Hampshire and Waterford, Oxford County, Maine. The latter specimen was collected by *F. Hyland,* no. 1263; the easternmost collections are from the Penobscot River Valley, clay terraces, Veazie, *Fernald and Long,* no. 14047, and bank of river, Bangor, July 2, 1905, *O. W. Knight.*

While it is not an extension of range into New Hampshire, the occurrence of *Clematis verticillaris* in Durham at the base of north-facing granite cliffs about one-half mile distant from the Oyster river and again within a mile of the University campus shows the diversity of flora that one may expect in the area.

[1] Jour. Arn. Arb. XI[1], 72, 1930.
[2] Op. cit., p. 94.
[3] RHODORA XL, 274, 1938.

The Clematis was pointed out to me in May, 1941, by David Allen, a student in zoology at the University of New Hampshire. A seam of basalt in the granite may supply the basic elements with which one regularly associates the Clematis in most of New England.

Data concerning the more significant of the above mentioned collections are as follows. All are from Durham in Strafford County.

LILIUM SUPERBUM L. Margin of salt marsh at Jackson's Landing on the Oyster river, *A. R. Hodgdon, H. Clapp, and F. Drumheller*, no. 5093.

CLEMATIS VERTICILLARIS DC. Rich shaded slope, base of granitic cliffs near Oyster river, *A. R. Hodgdon and David Allen*, no. 3443.

CEANOTHUS AMERICANUS L. Bank of clay near mouth of Crommet creek at Adams Point, *A. R. Hodgdon*, no. 2879.

IVA FRUTESCENS L. var. ORARIA (Bartlett) Fernald and Griscom. By shore at Adams Point, Great Bay, *A. R. Hodgdon*, no. 2784.

Specimens of each of the above have been presented to the herbarium of the New England Botanical Club. They are represented also in the University of New Hampshire herbarium.

I wish to thank Professor M. L. Fernald for supplying me with accurate range- and habitat-data of *Lilium superbum* and for calling my attention to the references mentioned in this article.

UNIVERSITY OF NEW HAMPSHIRE,
Durham, New Hampshire.

HERNIARIA GLABRA, VAR. SUBCILIATA IN NEW YORK.—In the autumn of 1942 a flowering specimen of an unrecognized illecebraceous adventive was collected by the writer in waste grounds in Van Cortlandt Park, Bronx Co., New York, in a locality removed from any cultivated site. About a month later ample material of the plant past anthesis was prepared for the herbarium, a few grams of the fruits having been carefully gathered from the soil beneath the plant-mats and inserted in a pocket; it was named by the contributor of this note and given to the New York Botanical Garden. On Sept. 5, 1943, the locality where the species had been discovered was revisited; the immigrant was found flourishing; and a flowering specimen, *Monachino*

(*Krukoff Herb.* No.) *17045,* was forwarded to the Gray Herbarium, Cambridge, Mass.

The plant has been determined as *Herniaria glabra* L. var. *subciliata* Babingt. and it best fits the description of this variety in Ascherson & Graebner's Synopsis des mitteleuropäischen Flora, although here there is some doubt whether it might not represent some form of *H. glabra* var. *scabrescens* Rud. de Roem. In Hegi's Flora von Mittel-Europa this latter variety is given in synonymy under *H. glabra* var. *setulosa* Beck, which is described like our plant but is a later name than either of the above.

Since a good description of *Herniaria glabra* can be had in many standard European floras, only some particular notes might be in place here. Our plant has the casual appearance of a small-leaved *Polygonum aviculare,* with a clearer and deeper green color. Closer examination, however, reveals the leaves opposite, although they are in pairs of unequal sizes (the smaller ones sometimes greatly reduced and escaping observation) and the branches of the stems are usually alternate. Stems minutely puberulent with curved hairs; leaves 1.0–2.5 mm. long and 0.5–1.5 mm. broad, sparsely ciliate to merely with several short bristles at apex, the interpetiolar white scarious stipules ciliate; flowers in axillary glomerules, inconspicuous, green and apetalous, about 1.2 mm. broad, the calyx puberulent and the lobes beset with a few bristles at apex; fruits falling enclosed by calyx, the seed about 0.5 mm. long, lenticular and with a tiny notch at one end, smooth, black and shining. Several dozen individual plants were seen growing both in the open and under weeds. The diameters of the plant-mats vary from 2 inches to over 1 foot. The seeds are borne abundantly, and English Sparrows have been observed pecking at the plants.

The species has long been recognized in European medicine as *herba herniariae* and used as a diuretic. It is distributed throughout almost all of Europe, western and northern Asia, and northern Africa. The Herniary is cultivated for carpet-bedding, rock-gardens and for covering graves. *Herniaria glabra* thus might have been expected momentarily to become a member of our weed-flora in the New World, although search in the herbarium of the New York Botanical Garden and literature failed to find previous record of its introduction here. Professor Fernald

tells me that *H. glabra* was collected on waste ground on a wharf at Bangor, Maine, July 7, 1903, *A. S. Pease*, no. 2634, in Herb. New Engl. Bot. Cl., and *A. H. Moore*, no. 1150, in Gray Herb. The related *H. cinerea* DC. was collected on sands along Green Bay, Wisconsin, in 1870 by Dr. J. M. Antoine, who sent material to Asa Gray. *H. cinerea* is also adventive in California.—Joseph Monachino, New York City, New York.

NOTES ON MINNESOTA PLANT LIFE

Olga Lakela

Alopecurus pratensis L., previously collected in the state from an experimental plot, has become established in Duluth. The specimen no. 5325 was collected from a large colony in a brookside meadow west of Woodland Ave. at Elizabeth St. Westward toward Chester Park School the meadow adjoins a cultivated hay field, but no other colonies of the species were found in the area.

Festuca rubra L. var. heterophylla (Lam.) Mut. was discovered growing in shade under natural birch and pine on Dr. E. W. Bohannon's lot adjoining the grounds of the Duluth State Teachers College. The bright green tufts of the filamentous basal leaves first were noted in the fall of 1942. The plants flowered in early July of 1943, coll. nos. 5308 and 5320. They best fit the description of the above variety in Hitchcock's Manual of the Grasses of the United States.

Carex conoidea Schkuhr occurs in Duluth. The colony was discovered at the bottom of a shallow moist ditch along Highway 61, North Shore of Lake Superior, about one and one-half miles northeast of Lester River, where specimens no. 5339 were collected. A search for additional colonies failed due to the cutting of the roadside vegetation late in July. In the University of Minnesota Herbarium the species is represented by a single previous collection from Goodhue Co. in southeastern part of the state. Thus, the Duluth station extends the range of the species to southern St. Louis County.

Carex Crawei Dewey, coll. nos. 5322 and 5349 constitute a record for the state. Although Minnesota lies within the range

of distribution of this species, no other collections are known. Conway MacMillan's[1] inclusion of the species in the flora of Minnesota Valley is not substantiated by specimens. The Duluth station is located in the same meadow where *Alopecurus pratensis*, loc. cit. was collected. The plants were associated with *Carex aurea* Nutt.

Carex flava L. appears to be restricted to northeastern Minnesota. The single previous collection in the University Herbarium was made in 1878 at Little Marais in Lake County. Farther inland from Lake Superior the species has been encountered in several localities. Coll. nos. 4586, 4734 and 4795 were made at the Springs, a wayside picnic station, on Tofte-Isabella Road in Lake County. The plants were growing on mossy sides of a creek arising from the springs and flowing into a small nearby lake. Another Lake County station came into attention on the shores of a lake at Superior National Forest Lodge on Ely-Finland Road. There the specimen no. 4804 was collected. In St. Louis County a colony was discovered at the mouth of a creek entering Pequaywan Lake in Cloquet Valley Forest, coll. no. 4202, first erroneously referred to *C. cryptolepis* Mackenzie.

Sisyrinchium graminoides Bicknell is an interesting discovery in Duluth. On July 5, 1943, during a collecting trip on the North Shore of Lake Superior within the city limits, Dr. and Mrs. Robert Gregg first found the plant on the grassy roadside slope of Highway 61 about one and one-half miles from Lester River. My interest was aroused when I noticed Dr. Gregg carrying a different-looking *Sisyrinchium*, one with peduncled spathes. We walked back to locate the plants. From the few scattered clusters I sparingly collected a specimen for a record. However, a little farther on toward Duluth on the same roadside we came to a colony of several square yards of closely clustered plants in full flower. Coll. nos. 5340, 5353, and 5396 were made at different times for maturing fruits. The flowers are violet and the plants darken a little on drying. The old leaf-bases become loose and shreddy in maturity; during anthesis they are very conspicuous. The locality of the colony is the same as that

[1] MacMillan, Conway. The Higher Seed-Producing Plants of Minnesota Valley Minn. Geol. Nat. Hist. Surv. Bot. Ser. I. p. 119. 1892.

of *Carex conoidea,* loc. cit. In different Floras and Manuals Minnesota is included within the range of the species, but it is not known to occur elsewhere in the state. There are no previous specimens in the University Herbarium.

Filipendula Ulmaria (L.) Maxim. is so well established on the North Shore of Lake Superior near Lakewood Station that it is difficult to associate it with introduced plants of European or Asiatic origin. Whether the species grows along water courses or in borders of swamps, it exerts local dominance. The two forms occur together in the same colonies. Coll. nos. 5261, 5415, and 5481 represent the typical form characterized by short white pubescence on the lower surface of the leaves. In a colony situated in a swampy creek bed on Lake Superior terrace, Highway 61 at the junction of Lakewood Road, var. *denudata* (Presl) Beck is more numerous than the typical form, coll. nos. 5480. Many individuals in the colony are intermediate as to leaf-pubescence in having on a single stem leaves that appear wholly white on the lower side, or wholly green and others mottled with white and green, as in coll. no. 5482. A double sterile form, obviously a recent garden escape, occurs in another locality about eight miles north of Duluth on Highway 53 about one mile west of Jackson School. The colony is established in a border of an *Alnus* swamp, coll. no. 5426, and occurs with well-growing plants of *Sorbaria sorbifolia* (L.) A. Br.

Oxalis europaea Jordan occurs along borders of flower beds in East Duluth. It also was discovered in undergrowth of Tischer Creek woods in Hunters Park, coll. no. 5404. There are no previous collections from the state in the University Herbarium.

Angelica atropurpurea L. occurs commonly in east central part of the state. Coll. no. 5447 extends the range of the species to East Beaver Bay, Lake County. A colony grows on the shore of Lake Superior at the Johnson's Resort.

Lobelia inflata L., coll. no. 4543, was made at Crane Lake on the grounds of the Randolph Resort. It extends[1] the range of the species from east-central Minnesota to Canadian border lakes in St. Louis County.

[1] See McVaugh, Rogers. Studies in the Taxonomy and Distribution of Eastern North American Species of *Lobelia.* Rhodora 38: 323, fig. 20. 1936.

CAMPANULA GLOMERATA L., not previously collected in the state, was discovered in a young growth of *Populus balsamifera* L. on Highway 61, less than a mile from the Lakewood Road. The tall and coarse plants appeared startlingly strange, but a single flower in the fruiting specimens betrayed their natural affinities, thus aiding in field identification at least to the generic category. Coll. no. 5416 was made from the colony.

STATE TEACHERS COLLEGE,
Duluth, Minnesota.

GERANIUM NERVOSUM.—Dr. L. R. Abrams of Stanford University has drawn attention to an error in our recent revision[1] of the perennial species of *Geranium* of the United States and Canada. Through a regrettable oversight we took up (on p. 22) the name *G. strigosius* St. John, although two earlier available names are plainly listed as synonyms in the accompanying bibliography of this species. Accordingly, it now becomes necessary to reinstate the name *G. nervosum* Rydb., and to relegate *G. strigosius* St. John (published originally as *G. strigosior*) to synonymy.—G. NEVILLE JONES, University of Illinois.

[1] RHODORA 48: 5–26; 32–53. 1943.

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Gray Herbarium of Harvard University, Cambridge, Mass.

H pl. 812-816

Photo. H. G. Fernald.

Smilax Pseudo-China: fig. 1, syntype, after photograph sent by Dr. *John Ramsbottom;* fig. 2, type, after photograph sent from Linnean Society of London; both reduced; 1 leaf × 1

Rhodora

JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 46. February, 1944. No. 542.

A NEW SPECIES OF BAPTISIA

Wilbur H. Duncan

In the summer of 1942 specimens of a strange *Baptisia* in flowering condition were collected ten miles south of Jesup in Wayne County, Georgia. This plant was quite abundant in an open, pine woods on a low, sandy ridge. Another visit was made to the area on September 3, 1942, and collections were made of the plant in fruiting condition. No other species of *Baptisia* was located in this immediate area. All of the specimens from the above two collections were later lost in the mail but other specimens were obtained on July 4, 1943. A careful survey revealed plants over an area about ten miles in length.

It readily became evident that this *Baptisia* had not been described. The plants possess only simple leaves which lack completely the perfoliate character of those of *B. perfoliata* (L.) R. Br., which it most nearly resembles from a distance. Another character which strikingly separates this new species from other simple-leaved species is the presence of cobwebby and closely appressed hairs over all surfaces of the entire plant. Furthermore, nearly all the leaves are cordate. Thus, in the latter two characters this species is unlike either *B. perfoliata* or *B. simplicifolia* Croom, the two species previously described as characteristically possessing simple leaves.

The plant is described as follows:

Baptisia **arachnifera,** sp. nov. (Figs. 1–5), plant 5–8 dm. tall, retaining color upon drying, entirely covered with cobwebby (or wooly) and closely appressed hairs (only the stamens, petals, and inner part of calyx-tube glabrous); stem fairly stout, lightly

ribbed, widely branched, the branches ascending and arising alternately from the primary stem or stems; leaves simple, ashy green, slightly yellowish beneath, later becoming much darker, covered throughout with hairs, mostly cordate (those near the base rarely somewhat reniform, those near the top sometimes ovate), leathery, strongly veined, somewhat clasping at the base, rounded at apex, the margins entire and sometimes slightly revolute, 2–8 cm. long, 1.5–7 cm. broad; racemes terminal,

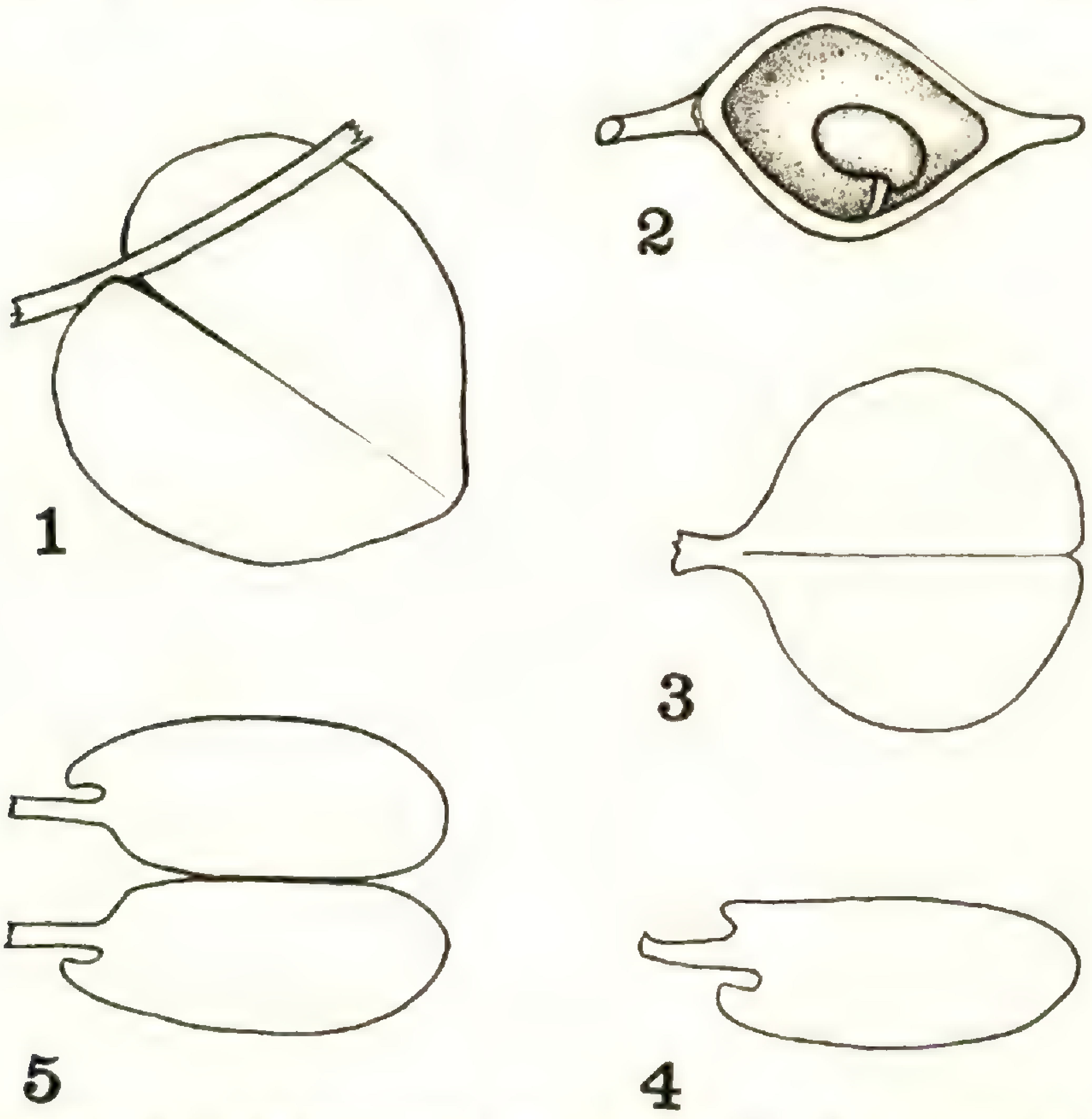

FIG. 1. Portion of stem and leaf attached, × ½. 2. Longitudinal section through fruit showing a single seed, × 2½. 3. Standard of flower, × 2½. 4. Wing of flower, × 2½. 5. Keel of flower, × 2½.

compact, 3–20 cm. long; flowers pedicellate, pedicels 1–5 mm. long, the lowermost subtended by suborbicular, foliaceous bracts up to 10 mm. long and 12 mm. broad, the uppermost by ovate bracts 3 mm. long and 1.5 mm. broad; calyx campanulate, about 5 mm. long, the inner part of the tube glabrous, lobes about as long as tube, the upper lip broad and entire or minutely cleft, the lobes of the lower lip broadly lanceolate; corolla yellow, standard orbicular and emarginate (11 mm. long, 10 mm. broad), wings and keel oblong (about 13 mm. long and 5 mm. broad); pod quite hairy without, closely pubescent inside, irregular in shape, varying from subglobose to ellipsoid, body 8–15 mm. long

and 6–10 mm. broad, the beak about 3 mm. long and mostly straight, the stipe 4–6 mm. long.

Herba 5–8 dm. alta, omnino dense appresso-tomentosa; caule crassiusculo, leviter striato, late ramoso, ramis alternatis, ascendentibus; foliis 1-foliolatis, dilute viridibus, subtus paulo lutescentibus, plerumque cordatis (infimis raro subreniformibus, supremis interdum ovatis), coriaceis, valde nervatis, basi caulem subamplectentibus, apice late rotundatis, margine integris et interdum paulo revolutis, 2–8 cm. longis, 1.5–7 cm. latis; racemis terminalibus, 3–20 cm. longis; floribus pedicellatis, pedicellis 1–5 mm. longis, bracteolatis; calyce campanulato, ca. 5 mm. longo, extus dense pubescente, intus glabro, laciniis tubum subaequantibus, labio superiore lato, integro vel paululo emarginato, laciniis inferioribus late lanceolatis; corolla flava, vexillo orbiculari et emarginato (11 mm. longo, 10 mm. lato), alis carinaque oblongis (ca. 13 mm. longis et 5 mm. latis); legumine extus dense pubescente, intus molliter pubescente, subgloboso vel ellipsoideo, 8–15 mm. longo et 6–10 mm. lato, rostro 3 mm. longo et plerumque recto, 4–6 mm. stipitato.

Distribution: on sandy soil, mostly in open, pine woods, occasionally in denser, mixed woods; Wayne County, Georgia.

The type specimen (sandy soil in open, pine woods, July 4, 1943, *Duncan 5693*) is deposited at the Gray Herbarium, Cambridge, Massachusetts, U. S. A. Isotype specimens are being distributed in the *Plantae Exsiccatae Grayanae.*

The author wishes to acknowledge the valuable aid afforded by "Monograph of the Genus Baptisia", Annals Missouri Botanical Garden **27:** 119–244, April, 1940, by M. M. Larisey; and for specimens loaned by the Missouri Botanical Garden. Thanks are gratefully given to Dr. Lyman B. Smith of the Gray Herbarium for assistance in the preparation of the manuscript and in distribution of specimens.

University of Georgia and
United States Public Health Service.

Aster **acadiensis** nom. nov. *A. lateriflorus* var. *tenuipes* Wiegand, Rhodora **30:** 174, 1928. *A. tenuipes* Shinners, Rhodora **45:** 346, 1943; non *A. tenuipes* Makino, Bot. Mag. Tokyo **12:** 64, 1898.

I am indebted to Miss Marjorie W. Stone and to Mr. C. A. Weatherby for bringing the above error to my attention.—L. H. Shinners, Madison, Wisconsin.

OVERLOOKED SPECIES, TRANSFERS AND NOVELTIES IN THE FLORA OF EASTERN NORTH AMERICA

M. L. Fernald

(*Continued from page 21*)

Smilax Pseudo-China L. Sp. Pl. 1031 (1753). *S. tamnifolia* Michx. Fl. Bor.-Am. ii. 238 (1803). Plate 812.

Smilax Pseudo-China, named from resemblance to the Asiatic *Smilax China* L., the *China radix* of Bauhin, was included, along with *S. lanceolata* L., by Linnaeus in a section of the genus with unarmed terete stems. The treatment was as follows:

**Caule inermi tereti*

. . . .

13. SMILAX caule inermi tereti, foliis inermibus: caulinis cordatis, racemis [corrected to rameis in ed. 2] ovato-oblongis. *Pseudo China*

Smilax [misprinted Simlax] caule tereti inermi, foliis inermibus: caulinis cordatis, ramorum lanceolatis, pedunculis longissimis. *Gron. virg. 193.*
Smilax caule tereti inermi, foliis cordato-ovatis acutis inermibus, petiolis bidentatis. *Hort. Cliff. 495. Gron. virg. 120.*
Smilax virginiana, spinis innocuis armata, latis canellae foliis, radice arundinacea crassa nodosa & carnosa. *Pluk. alm. 349, t. 110. f. 5.*
Smilax aspera, fructu nigro, radice nodosa magna laevi farinacea. *Sloan. jam. 105. hist. 1. p. 231. t. 143. f. 1.*
China spuria nodosa. *Bauh. pin. 297.*
Habitat in Virginia, Jamaica.

It is at once evident that, as usual, Linnaeus had no clear understanding of American species and that his citations covered different species. The phrase "Caule inermi" of his major grouping of the primary diagnosis (of the plant he had actually before him in his own herbarium), of the quotations from Gronovius and from Linnaeus' Hortus Cliffortianus at once contrast with "spinis . . . armata" of the Plukenet reference and "Smilax aspera" of Sloane. Singularly enough, Alphonse De Candolle in his Smilacées in DC. Mon. Phan. i. 82 (1878), although saying "Linn. Sp. p. 1461 [ed. 2], excl. syn. post Gronov.", placed it, along with *S. rotundifolia, S. glauca,* etc. in the group with "Folia persistentia vel subpersistentia" and described it "aculeis in caule crebris; . . . limbis margine setaceo-ciliatis". In other words the *S. Pseudo-China*, sensu A. DC. (and many followers), not L., is *S. Bona-nox* L., which was

originally described "foliis ciliato-aculeatis." It, therefore, becomes necessary to determine what Linnaeus actually had in his own herbarium prior to 1753. Fortunately there is a characteristic sheet of foliage marked by Linnaeus "K. *Pseudo-China*". This, undoubtedly collected by Kalm ("K") in New Jersey or Delaware, is characteristic *S. tamnifolia* Michx. Fl. Bor.-Am. ii. 238 (1803). A portion of the Linnean TYPE is reproduced as our FIG. 2. The first Gronovian reference given by Linnaeus is supported by a fruiting branch in the herbarium of Gronovius at the British Museum, badly crumpled and unsightly, also by a very beautiful flowering plant (our FIG. 1). These are likewise *S. tamnifolia* with very long peduncles. The third reference, to Hortus Cliffortianus, carries back to the Plukenet figure cited by Linnaeus, which is of some woody species, presumably *S. Walteri* Pursh, since its foliage will do for that species and, in the place cited, Pluketet identified it with Virginian specimens with "baccis coccineis"; and the second Linnean reference to Gronovius is supported by a characteristic lateral sprig of flowering *S. rotundifolia!* The *Smilax aspera* of Sloane need not specially concern us, since it is so clear that the primary material, the plant which Linnaeus had in his own herbarium and the two Clayton (Gronovian) specimens with smooth stems are so definitely the true type and syntypes of *S. Pseudo-China.* The beautiful photograph sent from Paris of the type of *S. tamnifolia* Michx. is unequivocal. It is, consequently, worth noting that Michaux thought it might be the *S. caule tereti, foliis inermibus: caulinis cordatis, ramorum lanceolatis, pedunculis longissimis* of Gronovius (our FIG. 1). The point which Michaux did not note is, that this was the best syntype of *S. Pseudo-China* L. (1753).

Further showing the utter confusion of Linnaeus in interpreting North American species of *Smilax* is the fact that, although he described in his section with *Caule aculeato, tereti* a new species as *S. tamnoides* L. Sp. Pl. 1030 (1753), the specimen in his own herbarium marked *S. tamnoides* is an unusually good piece of unarmed, herbaceous-stemmed *S. Pseudo-China* (*S. tamnifolia* Michx.) while the Catesby plate, from which the characters were obviously drawn, is of a prickly-stemmed, evergreen, high-climbing and broad- and eciliate-leaved extreme of an-

other species! In fact, the specimen preserved by Linnaeus as representing his *S. tamnoides* not only has the unarmed stem, the slightly panduriform leaves, the long peduncles and loosely globose inflorescence of *S. Pseudo-China* (*S. tamnifolia* Michx.). One of its inflorescences even shows with diagrammatic sharpness the elongate-clavate styles of that species.

In my conclusion that the plants selected are the real types of *Smilax Pseudo-China* I am quite in agreement with Dr. Pennell who, in 1916, wrote:

> *Smilax Pseudo China* L. *l. c.* 1031. 1753. "Habitat in Virginia, Jamaica." Species clearly aggregate, represented in the Linnean herbarium by specimens written up by Linnaeus as follows, according to a letter of B. D. Jackson: "three sheets pinned together; the first is 'II K Pseudo China', it is a barren branch, the leaves leathery; the second sheet is written up 'II' and seems quite the same plant as the former, but has one berry, the third sheet is of a West Indian species, coll. by Patrick Browne in Jamaica, probably *S. celastroides*." From the wording of the Linnaean description none of these can be considered the type of *S. Pseudo China*, but this would be rather a specimen of Gronovius, also studied by Linnaeus, now in the Gronovian herbarium in the British Museum. The description of Linnaeus is word for word from Gronovius, except for the addition of the phase "racemis ovato-oblongis," inappropriate for any *Smilax* whatever. "Smilax caule tereti inermi: foliis inermibus, caulinis cordatis, ramorum lanceolatis; pedunculis longissimis," Gronovius, Fl. Virg. 156. 1742, citing Clayton's Nos. 541, 561 and 630, is represented in the herbarium by Nos. 561 and 630 (for No. 541 see above note under *S. herbacea*). These two numbers are identified by Dr. A. B. Rendle as both the same as No. 541, that is, as genuine *Smilax herbacea* L. For the verification of these two Linnaean types I am indebted to Dr. B. Dayden Jackson, of the Linnaean Society of London, and to Dr. A. B. Rendle, of the British Museum.—Pennell in Bull. Torr. Bot. Cl. xliii. 413, 414 (1916).

Unfortunately, Pennell did not himself see the specimens discussed; had he done so he certainly would not have reduced *Smilax Pseudo-China*, correctly typified by him, to *S. herbacea* L. He depended upon identifications by the late Drs. B. Daydon Jackson and A. B. Rendle, neither of whom clearly understood the species involved. The plant generally passing as *S. herbacea* rarely if ever has any tendency to panduriform leaves. Its leaves, varying from oblong-ovate to cordate-subrotund, are glaucous and glabrous beneath, the flowers much larger than in *S. Pseudo-China,* with the styles rather broadly lingulate, the berries glaucous. Whether the type of *S. herbacea,* from Vir-

ginia (*Clayton*), is of this species (*S. pedunculata* Muhl.) or *S. pulverulenta* Michx. can be determined only by actual (future) examination of the material. The two photographs of the specimens (one sheet in Herb. L., the other in the Gronovian Herbarium) are of identical plants. The foliage is young, but it looks green and lustrous beneath, as in *S. pulverulenta* Michx. Until the specimens can be actually studied we may retain the names *S. herbacea* and *S. pulverulenta* as currently used.

Although Pennell, l. c. 414, placed *Smilax inermis* Walt. Fl. Carol. 244 (1788), as well as *S. Pseudo-China*, in the synonymy of *S. herbacea*, rather than place them with *S. tamnifolia*, it now seems clear that Walter's species was identical with *S. Pseudo-China*. Pennell said "Type, presumably from Berkeley County, South Carolina, not verified". Walter's diagnosis was perfectly good for *S. Pseudo-China;* Berkeley County is on the outer Coastal Plain and it is notable that Pennell's only stations, in his early paper, for *S. herbacea* from Virginia (south of Fairfax County) North Carolina, South Carolina and Georgia were all from along the Blue Ridge or the Alleghenies, while he specially designated the area of *S. tamnifolia* as "Coastal Plain; Long Island to South Carolina". In the Gray Herbarium, as in those studied by Pennell, there is no so-called *S. herbacea* from the Coastal Plain from south of Virginia. Walter's *S. inermis*, "presumably from Berkeley County, South Carolina", had the weak ("infirmo") stem only 3 feet high ("tripedali"). The southernmost specimens in the Gray Herbarium of *S. Pseudo-China* are three from Berkeley County, South Carolina (Santee Canal, *Ravenel;* west of Chicora, *Godfrey & Tryon*, no. 868; Moncks Corners, *Godfrey & Tryon*, no. 1411), one from Charleston County, South Carolina (north-northwest of McClellanville, *Godfrey & Tryon*, no. 1112) and one from eastern Georgia (Savannah, *Mrs. Say*). Incidentally there are in the Gray Herbarium no specimens (not even from Wilmington) from North Carolina and Pennell saw none from that state. Is it really absent from or rare in the broad area between southern South Carolina and southeastern Virginia? This gap is frequent in the known ranges of many species.

Nemexis elliptica Raf. Aut. Bot. 131 (1840) with stem "6 to 12 inches high, leaves uncial", the stem with quadrate, elliptic

leaves acute at each end, from Alabama, might have been *Smilax Hugeri* (Small) J. B. Norton in Pennell in Bull. Torr. Bot. Cl. xliii. 420 (1915), based upon *Nemexia Hugeri* Small (1903). Since the combination *Smilax elliptica* already exists for other species Rafinesque's *Nemexis elliptica* need not disturb us, but by those who maintain *Nemexia* as a genus it must be considered.

Another and quite clear synonym of *Smilax Hugeri* is *S. herbacea* sensu Walt. Fl. Carol. 243 (1788), not L. His "caule annuo inerme stricto suberecto 2–5 pedali, simplici, foliis verticillatis ovatis . . . cirrhis obsoletis", etc. are unequivocal for a plant which is well known from southern and southeastern South Carolina and from Georgia.

Smilax Bona-nox L., var. **exauriculata,** var. nov. (tab. 811, fig. 3), foliis oblongo-lanceolatis subacuminatis basi cordatis nec panduriformibus, margine setoso-ciliatis.—Virginia: Norfolk, *Reed*? (type in Herb. Gray.).

S. Bona-nox, var. **hederaefolia** (Beyrich), comb. nov. *S. hederaefolia* Beyrich ex Kunth, Enum. v. 209 (1850). *S. Bona-nox*, subsp. *hederaefolia* (Beyrich) A. DC. in DC. Mon. i. 77 (1878).

As it extends northward into eastern Virginia (more locally northward) *Smilax Bona-nox* is nearly as variable as farther south. In this northeastern area of its broad dispersal it occurs in three (perhaps four) quite definite variations. Typical *S. Bona-nox* L. Sp. Pl. 1030 (1753) was, most exceptionally, not so much confused as most of Linnaeus's North American species. Although he included a West Indian shrub of Bauhin, he gave the "*Habitat in* Carolina" and the species rests primarily on *Smilax, foliis latis in margine spinosis, caroliniana, stipite quadrato,* Pluk. Alm. 348, t. 111, fig. 3; the Linnean diagnosis drawn directly from Plukenet: "SMILAX caule inermi [because Plukenet had merely a sterile tip] angulato, foliis ciliato-aculeatis." Typical *S. Bona-nox,* therefore, is the slender, straggling and rarely climbing, freely branched shrub with deltoid-ovate to slightly panduriform leaves usually mottled with white, the rounded basal lobes short and tapering into the upper part of the blade, the margins bristly-ciliate. Its northern limit seems to be in Wicomico County, Maryland (*J. J. Carter* in Herb. Phil. Acad.).

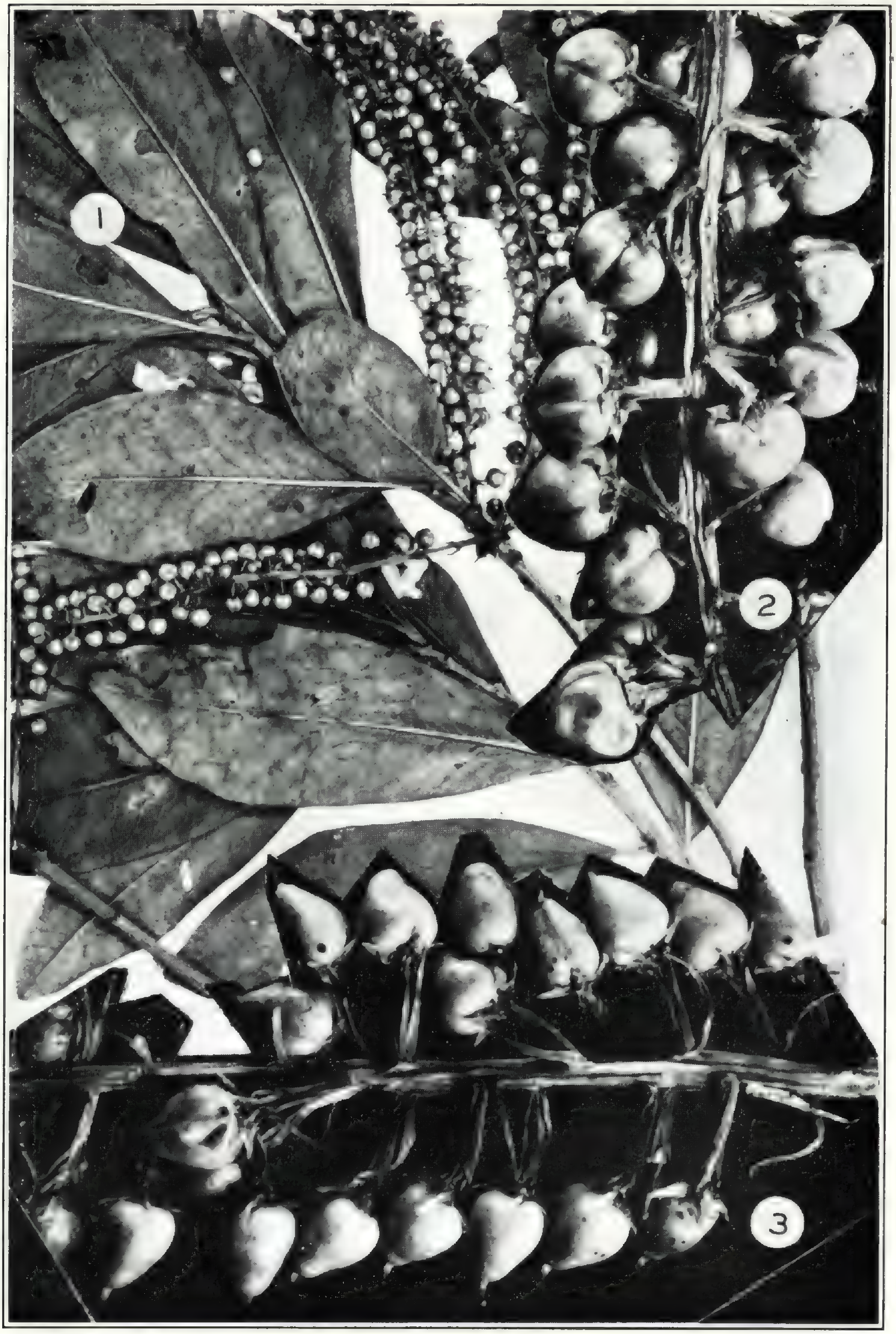

Photo. B. G. Schubert.

CYRILLA RACEMIFLORA: FIG. 3, fruit, × 5
Var. SUBGLOBOSA: FIG. 1, portion of fruiting branch, × 1; FIG. 2, fruit, × 5; both from TYPE

Photo. B. G. Schubert.

PHACELIA FALLAX, all figs. from TYPE: FIG. 1, portions of plant, × 1; FIG. 2, young inflorescence, × 3; FIG. 3, portion of mature calyx, × 10; FIG. 4, seed, × 10

Linnaeus picked up another of Plukenet's figures. This was *S. Bona-nox* β. of L. Sp. l. c. "Smilax caroliniana, stipite quadrato leni, foliis angustis asperis auriculatis ad basin angulosis. *Pluk. alm.* 348, *t.* 111. *f.* 3." Somewhat later this was taken up as a species: *S. hastata* Willd. Sp. iv². 782 (1806), Willdenow emphasizing the point shown by Plukenet, that the very narrow leaves are "margine ciliato-aculeatis". This extreme with narrowly lanceolate bristly-ciliate blades with narrow divergent basal lobes occurs occasionally in the Carolinas and southward. The Virginia material is slightly transitional but may be called *S. Bona-nox*, var. *hastata* (Willd.) A. DC. in DC. Mon. i. 79 (1878).

The third variety with strongly bristly-ciliate leaves is the very extreme plant described above as var. *exauriculata.* The type material is an old sheet from Norfolk, collected probably by Reed who got in the neighborhood of Norfolk several species otherwise and not recently known from Virginia. Var. *exauriculata* is very extreme in having elongate oblong-lanceolate, tapering, ciliate-margined leaves with nearly parallel sides and cordate (not hastate or subhastate) bases. It piques the curiosity! The specimen was sent out as *S. hastata*, var. *lanceolata* Pursh. It can hardly be that, however. Pursh gave no new description; he was simply giving a name to the *S. lanceolata* Walt., perhaps not L.: "caule angulato spinoso; foliis longis angustis lanceolatis inermibus". Var. *exauriculata* could not be described "foliis inermibus". I am tentatively placing with it a sheet from "dry bank, Santee Canal, 5 miles west of Pineville, Berkeley County, South Carolina, *Godfrey & Tryon*, no. 630 (distrib. as *S. glauca*). Its leaves are chiefly oblong, rather than lanceolate.

The extreme of *Smilax Bona-nox* with "foliis inermibus" is a coarse and usually high-climbing shrub with ovate, deltoid or broadly panduriform leaves usually green above and with eciliate or very weakly and casually ciliate leaves on the fertile branches. Basal sprouts may have ciliate and mottled leaves but the foliage of the adult branches is rarely so. This often high-climbing vine has the leaves up to 8 (on sprouts to 12) cm. broad and in good development is very different from typical *S. Bona-nox*. It is var. *hederaefolia*, which rests on *S. hederaefolia* "Beyrich ined." ex Kunth (1850), treated by Alphonse DeCandolle as *S. Bona-nox*, subsp. *hederaefolia.* Beyrich's

original material was from shores of Savannah River, Georgia. To this citation DeCandolle added "Virginia (Rügel . . .)". Var. *hederaefolia* is the commonest extreme of the species. In southeastern Virginia it abounds on damp shores or in low woods, the typical form of the species preferring open and drier habitats. Var. *hederaefolia* reaches Delaware (*A. Commons* in Herb. Phil. Acad.) and is isolated on Nantucket Island in southeastern Massachusetts.

Smilax tamnoides L. Sp. Pl. 1030 (1753) was another species not understood by its author. His species rested upon two items: the first a specimen of the unarmed herbaceous plant which on the next page he described as *S. Pseudo-China,* the plant which has regularly passed as *S. tamnifolia* Michx. The second and sure basis of *S. tamnoides* was the description and plate of *Smilax Bryoniae nigrae* foliis, caule spinoso, baccis nigris of Catesby, Carol. i. 52, t. 52. Linnaeus took his brief diagnosis primarily from Catesby: "SMILAX caule aculeato tereti" and the species was placed by him in the section **Caule aculeato, tereti.* There can be no question that the type of *S. tamnoides* was the Catesby plate.

Catesby's description was vivid:

> This plant shoots forth with many pliant thorny stems; which, when at full bigness, are as big as a walking cane, and jointed; and rises to the height usually of twenty feet, climbing upon and spreading over the adjacent Trees and shrubs. . . . In Autumn it produces clusters of black round berries, hanging pendant to a foot-stalk, above three inches long," etc.

The only possible competitor is *S. Bona-nox,* var. *hederaefolia,* but that has square or at least 4-angled stems (Catesby's shrub terete), the leaves are strongly reticulate with prominent cross-veins (Catesby's not), and the fruiting peduncles are 1–3 cm. long, merely ascending to divergent or rarely recurved (Catesby's shrub with pendulous fruiting peduncles 5–6 cm. long, with pedicels much longer than in *S. Bona-nox*). Catesby's plate is a beautiful match for the terete-stemmed plant, with relatively thin though firm, and delicately veined often panduriform leaves, elongate, arching and finally drooping peduncles (up to 6.5 cm. long) and long pedicels, which occurs on the Coastal Plain from Florida to southeastern Virginia (perhaps farther north). This plant has been considered a variety of the wide-ranging, conti-

nental *S. hispida,* from which it differs in the development of some or many panduriform leaves. It has been designated in the Gray Herbarium by a critical student of the group as a southeastern variety of *S. hispida,* with an unpublished name indicative of its southern occurrence. In the Gray Herbarium there is no material of *S. tamnoides,* var. *hispida*[1] (*S. hispida*), the continental plant with leaves regularly ovate, from the Coastal Plain south of Virginia, where it extends from the interior down the calcareous valleys. All specimens from the Coastal Plain of Florida, Georgia and South Carolina have some or all of the leaves panduriform and are typical *S. tamnoides.* I have seen no such material from North Carolina.

Pursh, treating *Smilax tamnoides* as herbaceous (meaning *S. tamnifolia* Michx.) described as *S. pandurata* [he said *us*] Pursh, Fl. Am. Sept. i. 251 (1814), a species in his ***Caule fruticosa; ramis teretibus.* Pursh's brief description could have applied only to typical *S. tamnoides:*

> 14. S. aculeata; foliis ovato-panduraeformibus acuminatis 3-nervibus, pedunculo communi petiolo duplo longiore. *panduratus.*
> In sandy woods, New Jersey to Carolina. ♄. July.
> *v.v.* Leaves smooth and shining on both sides.

Note on Smilax lanceolata.—*S. lanceolata* L. Sp. Pl. 1031 (1753) was published as follows, under **Caule inermi, tereti:*

> 12. SMILAX caule inermi tereti, foliis inermibus lanceolatis. *Hort. Cliff.* 459. *Gron. virg.* 120.
> Smilax, viticulis asperis, virginiana, foliis angustis laevibus nullis auriculis praedita. *Pluk. alm.* 349 .*t.* 110. *f.* 4? *Raj suppl.* 344?
> *Habitat in* Virginia.
> Differt *nostra a Plukenetiana aculeorum absentia.*

Linnaeus himself, according to the late Dr. B. Daydon Jackson, had no material and my efforts to secure a photograph of the Hortus Cliffortianus and Gronovian plants have been unsuccessful. The Plukenet figure, cited by Linnaeus in *Hortus Cliffortianus* without query, is available and it is significant that Linnaeus stated that *S. lanceolata* differed from Plukenet's figure in lacking prickles. It should also be noted that *S. lanceolata* was from

[1] Smilax tamnoides L., var. **hispida** (Muhl.), stat. nov. *S. hispida* Muhl. ex Torr. Fl. N. Y. ii. 302 (1843).

Virginia. During ten seasons in the field my companions and I have sought, in vain, for the familiar rather thin-leaved plant with 3 stigmas and dark red berries which regularly passes as *S. lanceolata.* This species occurs in our extreme Southern States, Florida to Texas, north into South Carolina and Arkansas. I have seen no specimens of it from north of South Carolina. Everywhere in southeastern Virginia the coriaceous-leaved, evergreen *S. laurifolia* L. occurs, varying tremendously, with leaves from elliptic-oblong to narrowly lanceolate, obtuse to acuminate, the blades anywhere from 0.6–2 dm. long and 1–7.5 cm. wide. But it is always *S. laurifolia,* with intermittent tendrils, flowers expanding in autumn, black fruit ripening the second year, stigma and seed 1, etc. In its narrowest-leaved extreme, such as *Fernald & Long,* nos. 6778 and 13,919, its leaves are narrowly lanceolate and very close to those of the Plukenet figure. Of two sheets of one number retained at the Gray Herbarium, one has the branches as fiercely prickly as in Plukenet's illustration, while the second has them prickleless, as described by Linnaeus. Furthermore, the Plukenet figure is quickly matched by vigorous, prickly, narrow-leaved vegetative sprouts. It is most difficult for one who knows southeastern Virginia to believe that the plant inadequately described by Linnaeus as *S. lanceolata* was anything but the narrowest-leaved *S. laurifolia,* the type of which, as shown by the photograph before me, was the broad-leaved phase of the species.

Of great importance in interpreting the confused ideas of Linnaeus is the fact, that in *Species Plantarum,* after citing the reference to his brief account in *Hortus Cliffortianus* (which was based wholly or in part on the Plukenet figure) he appended "*Gron. virg.* 120." Now, if one looks in Gronovius he will find *Smilax* treated on pp. 120 and 193. On p. 120 two species have completed treatments, the third treatment was unfinished (as printed) and as an erratum was given on p. 193, "*Ibidem linea penultima lege.*" The first species on p. 120 had cordate-ovate leaves and was cited by Linnaeus under his *S. Pseudo-China.* Gronovius included under it "Smilax humilior, floribus dilute luteis, baccis rubris. *Clayt. n.* 82", which is, of course, *S. Walteri* Ell. (photograph of the Clayton plant before me). The second species in Gronovius, on p. 120, had "caule angulato

aculeato, foliis dilatato-cordatis" and included "Smilax late scandens Bryoniae nigrae foliis, caule spinoso . . . baccis atro-purpureis. *Clayt. n.* 81"; i. e., with angulate stems, leaves of Bryony and purple-black berries, it was one of the variations of *S. Bona-nox* L., surely not the red-berried so-called "*S. lanceolata*". The third species, revised on p. 193, with the admonition to substitute for the account on p. 120, was

> *SMILAX caule spinoso tereti: foliis ovato-oblongis, trinerviis, inermibus.* Smilax laevis Lauri folio, baccis nigris. *Catesb. Hist. Carol. Vol. I. T. 15.* Smilax sempervirens Lauri folio crasso: floribus parvis herbaceis; caule spinis rigidissimis armato; baccis nigricantibus. *Clayt. n. 617.*

Smilax laevis Lauri folio of Catesby was the best kind of *S. laurifolia* L.; in fact it was cited by Linnaeus in publishing that species. So too was the *Smilax caule spinoso tereti* (with his own changes to "caule aculeato tereti", etc.) of Gronovius, p. 193. These, in fact, were the only bases of *S. laurifolia* L. (1753). Surely, there is not much left to stand for *S. lanceolata* L. as a distinct species! One sometimes doubts the wisdom of starting our nomenclature of American plants with Linnaeus (1753). It is almost an exceptional North American species about which he was not hopelessly confused.

As pointed out by Morong, Bull. Torr. Bot. Cl. xxi. 434 (1894), Asa Gray, thinking of *Smilax lanceolata* in the usually accepted but obviously erroneous sense, as the southern, thinnish-leaved plant with 3 stigmas and dark red 3-seeded berries, "examined in 1881 the specimens in the Herbaria of Enslen and Sherard upon which Pursh founded his species [*S. ovata* Pursh, Fl. Am. Sept. i. 249 (1814)], and declares positively that they are *Smilax lanceolata*". *S. lanceolata* sensu Gray, Morong, Small and others is, then, *S. ovata* Pursh, whose description was good except for "berries black". In the herbarium they always lose their red color. Unfortunately, however, *S. ovata* Pursh (1814) is antedated by a different *S. ovata* Jaume St.-Hilaire (1800).

The first available name for *Smilax ovata* Pursh, not Jaume St.-Hilaire, seems to be S. Smallii Morong in Bull. Torr. Bot. Cl. xxi. 434 (1894). Morong described it from young flowering branches, with staminate flowers only, but a very full sheet of isotypic material before me is surely of the shrub erroneously passing as *S. lanceolata*. Small himself, in his Manual, reduces

to *S. lanceolata* sensu authors, not L., both *S. Smallii* Morong and *S. cinnamomifolia* Small in Bull. Torr. Cl. xxv. 609 (1898), the latter described as having "bluish-black" berries. In his Manual, where he reduces *S. cinnamomifolia,* the berries are called "dull-red". The type of *S. cinnamomifolia, Heller,* no. 4109, from Arkansas, was in ripe fruit. The isotype in the Gray Herbarium shows the crushed berries darkened, just as are the crushed and dried fruits of the admittedly red-berried shrub.

Until *Smilax Smallii* (*S. lanceolata* sensu most auth., not L.) is really collected in Virginia it may safely be excluded from the flora of the state.

Four of Rafinesque's Species of Sisyrinchium.—In his Autikon Botanikon (Cent. V), 65 and 66 (1840) Rafinesque, with the unusual clarity which contrasted much of his work in this rare volume with the slipshod technique of most of his publications, described four species of *Sisyrinchium.* Since these were overlooked by Bicknell in his detailed study of the genus and find no mention in current floras, it is desirable to note their probable identities. The original descriptions are copied below.

481, Sisyrinchium *flexuosum* Raf. caule dichot. flexuoso anceps, fol. brevis ensatis acutis vix nervosis, spathis lanc. diphylis ineq. fl. subeq. 3–4fl. capsulis ovoideis truncatis torulosis—Arkanzas and Texas, semipedal, leaves 1 or 2 inches, specimens in fruit only.

482, *Sisyr. tenuifolium* Raf. caulib. cespitosis genicul. filif. 2ang. fol. tenuis angustissimis elong. lin. filif. acutis, spathis 2valvis subeq. lanceol. fl. brevior 2–5fl. petalis obt. cuspid. capsulis globosis—Arkanzas and Texas, annual semipedal, leaves 2–4 inches long very slender, fl. blue, larger than in S. anceps.

483, *Sisyr. floridanum* Raf. Scaposum, fol. lin. lanc. acutis vix nervosis, scapis fol. subeq. lato bialatis, spathis ineq. bivalvis lanc. 2–4floris equante, petalis retusis cuspidatis, caps. obovatis—Florida, found by Baldwin, 4 to 6 inches high, annual leaves 2–4 inches, one line broad, flowers large white.

484, *Sisyr. niveum* Raf. scaposum fol. lin. angustis striatis nervosis acutis, scapis fol. longior bialatis, alis striatis, spathis sepe coloratis 3valvis, 2int. brevis subeq. 1 ext. longissima lanc. plicata, 6–8floris. petalis retusis cuspid. capsulis globosis—Alab. Kentucky &c, 6 to 8 inches high, leaves 3 to 5, half line wide, flowers size of S. anceps, snowy white, spathas more or less colored of red.

Species no. 481, *Sisyrinchium flexuosum* Raf., not Spreng. (1825), is undoubtedly *S. minus* Engelm. & Gray in Bost. Journ. Nat. Hist. v. 263 (1845). The description might well have been based on the type of *S. minus,* and the description of *S. minus* in

Small's Manual emphasizes the short leaves (2–7 cm. long) and the capsule "corrugated". Rafinesque said "capsulis . . . torulosis." Although *S. flexuosum* Raf. was the earliest name for this southwestern species, it was antedated by *S. flexuosum* (L.) Spreng. S. MINUS stands.

Species no. 482, *S. tenuifolium* Raf., suffers the same fate. Rafinesque gave a good diagnosis of *S. Langloisii* Greene, Pittonia, iv. 32 (1899). Compare with Rafinesque's diagnosis these phrases from Greene's description of *S. Langloisii:* "Densely tufted and very slender . . . : leaves very narrowly linear, 2 to 4 inches long . . . : stems scarcely ancipital, rather subterete [Raf. said "filif."] . . . . , . . . peduncles each with a single small few-flowered spathe, its bracts equal or nearly so . . . : . . . perianth large for so small a plant, blue." Characteristic plants of *S. Langloisii* closely match the account of *S. tenuifolium.* Rafinesque, however, was again out of luck, for there was an earlier *S. tenuifolium* Humb. & Bonpl. ex Willd. (1809). S. LANGLOISII stands.

Species 483, *S. floridanum* Raf., is more puzzling, on account of its large "white" flowers, for, so far as I can make out, no regularly white-flowered species occurs in Florida, unless possibly *S. albidum* Raf. Atl. Journ. 17 (1832). The "scapis . . . lato bialatis", their height and the leaves 1 line broad would do for *S. albidum.* It may so rest for the present. *S. floridanum* Raf. (1840), however, invalidates the name *S. floridanum* Bickn. in Bull. Torr. Bot. Cl. xxvi. 222 (1899), given to a very slender and pale plant first collected by Nash in high pineland of Lake County, Florida. Various coarser and darker-drying plants probably referable to *S. arenicola* Bickn. (incl. *S. fibrosa* Bickn.) have been wrongly distributed as *S. floridanum,* but an ISOTYPE (*Nash,* no. 13) and such material as *Blanton,* no. 6952 stand clearly apart. Since there is already a *S. Nashii* Bickn. his *S. floridanum* may appropriately be called

SISYRINCHIUM **Bicknellianum,** nom. nov. *S. floridanum* Bickn. in Bull. Torr. Bot. Cl. xxvi. 222 (1899), not Raf. Aut. Bot. 66 (1840).

Rafinesque's species no. 484, *S. niveum* from Alabama and Kentucky, can scarcely be anything but his already described *S. albidum* Raf. Atl. Journ. 17 (1832).

Quercus incana Bartram, Trav. 378 (1791). *Q. cinerea* Michx. Fl. Bor.-Am. ii. 197 (1803).

I fully concur in the decision of Dr. Francis Harper in Bartonia, no. 22: 3 (1943), that *Quercus incana* is *Q. cinerea.* Bartram's description was very brief: "Q. incana, foliis ovalibus integerrimis subtus incanis." Bartram was describing the trees and shrubs of high gravelly ridges of the upper Ogeechee River in central-eastern Georgia: "This day's journey was for the most part over high gravelly ridges, and on the most elevated hills appeared emerging out of the earth, rocky cliffs of a dark reddish colour; their composition seemed to be a coarse, sandy, ferruginous concrete . . . The trees and shrubs common on these gravelly ridges are as follows, Diospyros, Quercus rubra [meaning *falcata*], Q. nigra, Q. tinctoria or great Black Oak, Q. alba, Q. lobata, post White Oak, Q. incana, . . . Pinus lutea, Pinus taeda, . . . Pinus palustris", etc., a rather characteristic group of oxylophytic and more or less xerophytic species. These are the regular associates of *Quercus cinerea,* a characteristic species of dry sands and gravels, which, according to R. M. Harper, *Phytog. Sk. Altamaha Grit Reg. of Ga.* Ann. N. Y. Acad. Sci. xvii. pt. I. 249 (1906), "Ranges from the fall-line sand-hills [near Bartram's station] almost to the coast". Ordinarily the leaves of *Q. cinerea* are oblong, but they vary to oval or elliptic in broader-leaved individuals (Small says, "blades elliptic, varying to lanceolate or oblanceolate . . . Sand-ridges, dry woods, and pinelands.")

Trelease, *The American Oaks,* Mem. Nat. Acad. Sci. xx. 113 (1924), guessed that *Q. incana* Bartr. is the Live Oak, *Q. virginiana* Mill., but Bartram was thoroughly familiar with Live Oak; in fact he mentioned it more often than any other species and would not suddenly, in describing the characteristic covering of the inland Sand Hills, proceed to describe it as a novelty. *Quercus virginiana,* the true Live Oak, so familiar to Bartram, is, from Virginia to Georgia, an evergreen tree primarily of the outermost Coastal Plain. Harper, op. cit., did not know it on the Altamaha Grit which, at its northern boundary, approaches Bartram's station of *Q. incana.* The only representative of *Q. virginiana* in Harper's area is *Q. geminata* Small, which Bartram would have included under *Q. virginiana* and which is

found only well to the south of Bartram's area and in a different soil. So far as I can find, *Q. cinerea* is the only species of the "fall-line sand-hills" which Bartram could have meant by *Q. incana.*[1]

Quercus maritima Bartr. Trav. 164 (1791). From the "endless wild desert, the upper stratum of the earth of which is a fine white sand, with small pebbles, and at some distance appears entirely covered with low trees and shrubs of various kinds, and of equal heighth", along St. John's River north of Lake George, eastern Florida. From the description alone, "foliis obcuneiformibus obsolete trilobis minoribus", I do not venture to guess its identity. Too many shrubby species of Florida are candidates. Bartram's *Q. maritima* (1791), however, antedates *Q. maritima* (Michx.) Willd. (1805) and Raf. (1838). The last two were caught by *Index Kewensis*, the earliest of the series not.

Silene scabra Raf. Aut. Bot. 18 (1840), from "barrens of West Kentucky", is very definitely S. regia Sims (1814). Rafinesque's name, moreover, is invalidated by *S. scabra* Kit. (1814).

Prunus nemoralis Bartr. Trav. 408 (1791) should be added to the synonymy of *Padus caroliniana* Mill. Dict., no. 6 (1768) and of Prunus caroliniana (Mill.) Ait. Hort. Kew. ii. 163 (1789).

Barton's species, not entered in Index Kewensis, was from above Mobile, Alabama: "Prunus nemoralis, floribus racemosis, foliis sempervirentibus, nitidis."

Sebastiania **fruticosa** (Bartram), comb. nov. *Stillingia fruticosa* Bartr. Trav. 476 (1791). *Stil. ligustrina* Michx. Fl. Bor.-Am. ii. 213 (1803). *Sebastiania ligustrina* (Michx.) Muell.-Arg. in DC. Prodr. xv.[2] 1165 (1866).

Index Kewensis cites *Stillingia fruticosa* as starting with Spreng. Syst. iii. 805 (1826), while Sprengel credited it to Michaux (1803) who had no such name but described *Stil. ligus-*

[1] Even though some might doubt this interpretation of *Q. incana* Bartr. (1791) they can hardly doubt its priority over *Q. incana* Roxb. Hort. Beng. 104 (1814) and Fl. Ind. iii. 642 (1832). The Indian species should, apparently, be called *Q. lanata* Sm. in Rees Cycl. xxix. no. 27 (1819).

trina from "sylvarum umbrosis, ad ripas amnium Carolina et Georgia." Bartram, however, describing the "very curious and beautiful flowering and sweet scented shrubs" northwest of Cape Fear, North Carolina (near Wilmington), enumerated many of them: "particularly Callicarpa, Aesculus pavia, . . . Styrax, Stewartia, . . . Stillingia fruticosa, foliis lanceolatis, utrinque glabris, fructu tricocco". Though brief, the diagnosis of this characteristic shrub of the Coastal Plain, northward to southeastern North Carolina, is sufficient. M. A. Curtis in his Catalogue of the Indigenous and Naturalized Plants of North Carolina (1867) cited *Stil. ligustrina* as occurring in the "Low Dist.", *i. e.* on the Coastal Plain, and Wood and McCarthy in their Wilmington Flora, covering the country drained by both the Northeast and the Northwest Cape Fear Rivers, also listed it. In both lists the species is recorded on the authority of Dr. *J. F. McRee*, who was born at Wilmington and later had a plantation some miles north of that city.

Cyrilla racemiflora L., var. **subglobosa,** var. nov. (tab. 813, fig. 1 et 2), foliorum venis subtus vix prominulis; sepalis ovatis 1 mm. longis; fructibus depressis subglobosis sulcatis; stigmatibus perbrevibus.—Virginia: wooded swamp along Mill Creek, about 1 mile north of Skipper's, October 14, 1938, *Fernald & Long*, no. 9600 (type in Herb. Gray.; isotype in Herb. Phil. Acad.).

Typical *Cyrilla racemiflora* has a characteristic conic-ellipsoid or -ovoid drupe definitely longer than broad, though in exceptional specimens only slightly longer. In ripe material the drupes (fig. 3) show a continuous rounded surface with little or no sign of furrowing and the styles and stigmas are rather prominent, the lanceolate to lance-ovate sepals are 1–1.8 (usually 1.5) mm. long, their sharp tips evident beyond the half-diameter of the fruit. In typical *C. racemiflora*, furthermore, the mature foliage is usually prominently reticulate-veiny beneath. Var. *subglobosa*, the type in ripe fruit, collected in mid-October, has the reticulum of the lower, as well as the upper, leaf-surface rather faint; the sepals are the shortest in the species, 1 mm. long and ovate; and the depressed-subglobose drupes (figs. 1 and 2), definitely as broad as or broader than high, so that the sepals are relatively hidden, are broadly rounded to an almost emarginate summit and with a deep longitudinal furrow running

from base to apex and marking the boundaries of the 2 carpels; the style and stigmas are the shortest in the species.

Although occasional specimens of the wide-ranging and more typical *Cyrilla racemiflora* approach in one character or another the shrub from near Skipper's, the latter combines so many of these exceptional characters that I am designating it as a variety. Flowering material may show other differences.

In shape of drupe Var. *subglobosa* suggests the fruit described by Rafinesque for his *Cyrilla polystachya* Raf. Aut. Bot. 8 (1840), with "capsulis subglobosis". That shrub of Louisiana and Florida was described, however, as having the "fol. . . . imis . . . acutis . . . racemes 6 to 8 inches". It is most probably a phase of the narrow-leaved and small-fruited *C. parviflora* Raf., l. c., which differs in several characters from *C. racemiflora*.

In PLATE 813, FIGS. 1 and 2 are of TYPE of CYRILLA RACEMIFLORA L., var. SUBGLOBOSA: FIG. 1, portion of branch, × 1; FIG. 2, portion of fruiting raceme, × 5. FIG. 3 is a portion of a fruiting raceme of typical C. RACEMIFLORA, × 5, from west of Winfield's Mill, Dinwiddie County, Virginia, *Fernald & Long*, no. 13970.

AESCULUS SYLVATICA Bartr. Trav. 476 (1791). *Ae. neglecta* Lindl. Bot. Reg. xii. t. 1009 (1826); Sargent in Journ. Arn. Arb. v. 43 (1924).

The tree known as *Aesculus neglecta* is characteristic of woodlands along streams in central and eastern North Carolina and southeastern Virginia. In the latter state it reaches the inner border of the Coastal Plain along the Meherrin River, below Emporia. From North Carolina Sargent cites specimens from the Piedmont eastward to the fall-line sand-hills or the inner margin of the Coastal Plain: Alamance, Orange, Durham and Wake Counties, on Cape Fear drainage or (the Wake County station) on the Neuse. According to Lindley's original account and plate the flowers are cream-colored or pale-yellowish, "and beautifully veined with red; the lateral petals are also pinkish". The red and pink coloring may sometimes be nearly absent but the non-glandular pedicels and calyx, which characterize the species, hold. Bartram, ascending "the North West of Cape Fear" River, found "Aesculus sylvatica, floribus ex albo et carneo eleganter variegatis, caule arboreo". What else could it have been than *Ae. neglecta,* with "flowers . . . beautifully

veined with red", the species characteristic of eastern North Carolina and adjacent Virginia, South Carolina and Georgia, which Sargent cites from definite stations on Cape Fear River? The name was not recorded in Index Kewensis.

Neither did Index Kewensis pick up *Aesculus floridana* Bartram, l. c. 401 (1791) from northern Florida, described: "Aesc. Florid. ramis divaricatis, thyrsis grandis, flosculis expansis incarnatis." What he had I do not know. He was definitely distinguishing it from *Ae. Pavia* which he enumerated in the same list. If the latter species is ever subdivided Bartram's species must be taken into account.

Vitis campestris Bartram, Trav. 400 (1791), not Nutt. in Fraser's Cat. (1813) nor Baker in Mart. Fl. Bras. xiv². 200 (1871). *V. rotundifolia* Michx. Fl. Bor.-Am. ii. 231 (1803).

Vitis rotundifolia, the Muscadine, and its pale-fruited form, the Scuppernong, are among the most familiar and most prized wild grapes of the Southeastern States. When fully ripe the large grapes are intensely sweet and are harvested in great quantities for preserving. Unlike the great majority of our grapes, this species has few and simple tendrils, instead of many and forking ones. Consequently, although it may climb high when opportunity presents, it is most often sprawling over bushes or reclining on the sand or gravel, so that, in such habitats, its often too tempting and almost over-sweet berries are gathered by stooping. Thus, Elliott said: "This species of vine varies much in size, sometimes ascending the loftiest trees, more frequently humble" (Sk. ii. 687) and Darby said "sometimes not climbing". As to the fruit, Mohr (Pl. Life Alab. 6: 3), pays it the compliment which he accords no other species of Alabama: "Important as a table and wine grape" and, after speaking of the "Berries large, plum-purple", he adds: "Plants of spontaneous growth have been observed near Mobile bearing light amber-colored berries."

Bartram's party, crossing northern Florida en route to Mobile, where "Our road now for several miles led us near the Alabama", eventually left "the Alabama bearing away Southerly, and enter[ed] a vast open forest which continued above seventy miles, East and West, without any considerable variation . . . During our progress over this vast high forest, we crossed extensive open plains, the soil gravelly, producing a few trees and

shrubs or undergrowth, which were entangled with Grape vines (Vitis campestris) of a peculiar species [*Vitis rotundifolia* Michx. is so "peculiar" in many characters that Small makes it a separate genus, *Muscadina*], the bunches (racemes) of fruit were very large, as were the grapes that composed them, though yet green and not fully grown, but when ripe are of various colours, and their juice sweet and rich. The Indians gather great quantities of them, which they prepare for keeping, by first sweating them on hurdles over a gentle fire, and afterwards dry them on their bunches in the sun and air. and store them up for provisions: these Grape vines do not climb into high trees, but creep along from one low shrub to another, extending their branches to a great distance horizontally round about [Bailey, Gent. Herb. iii. 238, says of *V. rotundifolia* "climbing to 100 feet over bushes and trees"], and it is very pleasing to behold the clusters pendant from the vines, almost touching the earth, indeed some of them lie upon the ground." I have many times gathered from near the ground or from the surface of sand-hills or dunes and eaten more than my fill of the "very large . . . grapes [Michaux described his *V. rotundifolia* baccis magnis"], . . . their juice sweet and rich" of *V. rotundifolia.* Not only did the Indians of northwestern Florida and of Alabama gather and dry the large and sweet grapes "and store them up for provisions." Their successors in occupation of the region continue the custom, with obvious refinements. In his Nature's Garden for Victory and Peace, revised (Bull. Tuskegee Inst. Alab. no. 42), the late Dr. George W. Carver, ignoring the other 5 (and sour-fruited) species of *Vitis*, concentrated on the Muscadine, giving explicit directions for cleaning and preparing the fruits, after which "They may be dried whole or made into a leather . . . I much prefer the leather . . . of a fine flavor . . . I wish every housewife would try this." To those who intimately know the Muscadine and the Scuppernong, their growth-habit and fruit there can be no serious question that *V. campestris* Bartr. (1791) is the same as *V. rotundifolia* Michx. (1803). The change of name would have been made a half-century ago if Bartram's species had not been ignored by the editors of Index Kewensis.

Ammannia teres Raf. Aut. Bot. 39 (1840). *A. Koehnei* Britton in Bull. Torr. Bot. Cl. xviii. 271 (1891).

Rafinesque certainly had the plant of fresh to brackish tidal shores of Virginia to Florida (once in the Hackensack marshes of New Jersey) which Britton described as *Ammannia Koehnei*. Rafinesque's description was good:

296, *Am. teres* Raf. caule teres vix ramoso fol. obl. obt. carnosis, caulinis basi cord. ad medio. angustatis, rameis cuneatis brevis, fl. sepe solit—Virg. ad Carol. pedal, leaves twice as broad as in last, broader at both ends.

This necessitates the new combination:

A. TERES, var. **exauriculata** (Fernald), comb. nov. *A. Koehnei*, var. *exauriculata* Fernald in RHODORA, xxxviii. 437, tab. 449, figs. 4 and 5 (1936).

The "last", referred to above by Rafinesque, was his AMMANNIA MULTICAULIS, l. c. (1840). This was evidently *Rotala ramosior* (L.) Koehne, with the virgate stems simple, "fol. linearib., acutis, fl. sepe vertic—Virginia, pedal, leaves uncial", while no. 294, A. LINEARIFOLIA, cited as the same as *A. ramosa* of authors, but with "fol. linearib. obt. nonnulis basi dilatatis" was ROTALA RAMOSIOR, var. INTERIOR Fern. & Grisc.

A. LONGIFOLIA Raf. l. c. (1840) from its excellent description and the region, "Arkanzas and Louisiana," was A. COCCINEA Rottb. (1773); and A. DIFFUSA Raf. l. c. (1840) is apparently A. AURICULATA Willd. (1806).

None of these species of Rafinesque are recorded in Index Kewensis.

HERACLEUM MAXIMUM Bartr. Trav. 344 (1791). *H. lanatum* Michx. Fl. Bor.-Am. i. 166 (1803).

It is with real sadness that I seem forced to relinquish so long established and familiar a name as *Heracleum lanatum* Michx. But the species, which in the East extends south along the mountains to Georgia (*Small*), was detected by Bartram in the mountains of northwestern Georgia and briefly but passably described: "I observed growing in great abundance in these mountain meadows, Sanguisorba Canadensis and Heracleum maximum, the latter exhibiting a fine shew, being rendered conspicuous even at a great distance, by its great height and spread, vast pinnatified leaves and expansive umbels of snow-white flowers." We are sorry to give up the long established name; we should have been familiar with Bartram's earlier one had it been picked up, as were several names in the same book,[1] in

[1] Such names as *Anona pygmaea*, basonym of *Asimina pygmaea* (Bartr.) Gray; *Andromeda formosissima*, *Stewartia montana*, etc

Index Kewensis. Incidentally, the type of *Heracleum lanatum* consists of a portion of leaf of the *Heracleum* and a fruiting umbel of *Pastinaca sativa!*

THE PLANTS PASSING AS PHACELIA HIRSUTA (PLATES 814–816).

PHACELIA **fallax,** sp. nov. (TAB. 814), a *P. hirsuta* differt foliorum caulinorum lobis terminalibus cuneato-obovatis segmentis oblongo-obovatis; caulibus pedicellisque minutissime pilosis strigosisque; sepalis adscendentibus deinde tuberculato-ciliatis extus glabris vel glabratis intus glabris; seminibus transverse lineato-rugosis.—Mountain-region, western Virginia to Georgia. VIRGINIA: Giles County, May, 1869, *Canby.* GEORGIA: Stone Mountain, May, 1869, *Canby,* May 13, 1897, *Biltmore Herb.,* no. 4263, May 3, 1899, *Canby & Sargent,* May 24, 1899, near summit, *A. H. Curtiss,* no. 6458 (TYPE in Herb. Gray.), April 16, 1932, thin soil on slope, *E. J. Palmer,* no. 39,909; slope of Pine Mountain, 1 mile north of Lithonia, April 28, 1934, *Perry & Myers,* no. 998.

Phacelia fallax has been mistaken for *P. hirsuta* Nutt. in Trans. Am. Phil. Soc. v. 191 (1837), our PLATE 815, FIGS. 1–3; and Brand in Engler, Pflanzenr. iv^{251}. 65 (1913) gave under the name *P. hirsuta* a description of *P. fallax,* based exclusively on the plant of Stone Mountain (the Biltmore and the Curtiss exsiccatae), Brand specially emphasizing the tuberculate-based cilia of the sepals and the broad lobing of the leaves and saying: "Von anderern Standorten nicht gesehen. Gray gibt die Pflanze ferner an für M i s s o u r i bis O s t t e x a s." The latter, the region from which Brand saw no material, is the real area of *P. hirsuta* Nutt. Nuttall's species is definitely HIRSUTE; the TYPE or ISOTYPE (PLATE 815, FIG. 1) in the Gray Herbarium closely matches the original description of the species which came from "sylvan prairies" in Arkansas, in having the summit of the stem and the pedicels spreading-hirsute, the "pectinately-pinnatifid" leaves with linear segments, and the sepals during anthesis widely spreading. It is matched by a few collections from Arkansas, Oklahoma and eastern Texas; and Mr. Long sends me for checking a characteristic specimen, collected as an adventive, near Telford, Pennsylvania, June 14, 1901 by Dr. *C. D. Fretz.* The contrasts between the two species are given below and in PLATES 814 and 815.

P. hirsuta: principal cauline leaves deeply or pectinately pinnatifid, with linear to linear-lanceolate segments; summit of stem and pedicels spreading-hirsute as well as pilose; sepals during anthesis widely spreading to slightly reflexed, later ascending, their margins ciliate-hirsute with mostly slender-based hairs, the upper surfaces strigose. Plate 815, figs. 1–3.

P. fallax: principal cauline leaves with terminal cuneate-obovate lobe rarely cleft to the middle, the broader segments oblong to oblong-obovate; stem and pedicels minutely pilose, sometimes also strigose; sepals in anthesis appressed-ascending, their margins when mature ciliate with tuberculate- or pustular-based hairs, their upper surfaces glabrous. Plate 814.

The habitat of *Phacelia fallax* is rarely given on the labels before me. Such as indicate it say thin soil or mountain-slopes (in Georgia on granitic rock). Small, familiar with *P. fallax,* rather than *P. hirsuta,* says "Dry soil, rocks and open woods"; and McVaugh[1], who, like Brand, defines as the western *P. hirsuta* Nutt. the plant of Stone Mountain and vicinity with hairs of the sepals "often enlarged at base and terminating in raised pustules or teeth on the sepals," cites it for Georgia as a secondary member of the flora of the granite flat-rocks. Its habitat in Giles County, Virginia, is not recorded but since McVaugh's map (his fig. 1) of granitic outcrops of the eastern United States, showing them to extend northward across Virginia, indicates none of them in or very near Giles County, it is safe to say that there it was not found on granite. The localities in Georgia are, quite clearly, thin and subarid acid soil.

The locality for *Phacelia fallax* in Giles County, Virginia, cited by Gray, Syn. Fl. ii[1]. 164 (1878), by Brand, l. c. (1913) and the basis for the inclusion of Virginia in the range of the composite *P. hirsuta* in Gray's Manual and in Small's Manual, if taken into account by McVaugh, would have changed the tiny ellipse in northern Georgia (on his fig. 29) to an elongate tongue reaching western Virginia.

The habitats of true southwestern *P. hirsuta* (Arkansas, Oklahoma and Texas), on the other hand, are given as follows on the labels in the Gray Herbarium and in the Bebb Herbarium of the University of Oklahoma, the latter material kindly sent me for examination by Dr. Milton Hopkins, in addition to Nuttall's "sylvan prairies": wet prairie, Arkansas, *Bush,* no. 258; field,

[1] McVaugh, *The Vegetation of the Granite Flat-Rocks of the Southeastern United States.* Ecol. Monogr. xiii., especially p. 158 and fig. 29 (map) on p. 163 (1943).

Photo. B. G. Schubert.

PHACELIA HIRSUTA: FIG. 1, TYPE OF ISOTYPE, × 1; FIG. 2, portion of inflorescence, × 3; FIG. 3, seed, × 10
P. GILIOIDES: FIG. 4, plant, × 1; FIG. 5, young inflorescence, × 3; FIG. 6, seed, × 10

Photo. B. G. Schubert.

PHACELIA DUBIA: FIG. 1, young inflorescence, × 3; FIG. 2, portion of mature inflorescence, × 3; FIG. 3, seed, × 10
Var. INTERIOR: FIG. 3, portion of mature inflorescence, × 3, from TYPE

Ark., *F. L. Harvey*, no. 12; limestone, hillside, Ark., *Damaree*, no. 14830; wet places, Oklahoma, *McClary*, May, 1935; meadow soil, Okla., *DeVitt and Clark*, no. 50; prairies, Okla., *Robert Bebb*, no. 3856 and *Demaree*, no. 12,646; on slough, Okla., *Richard F. Mason*, no. 127; shaded bank of slough, Okla., *R. F. Mason*, April 14, 1937; creek-banks and open woods, Okla., *Houghton* as *Stevens*, no. 2137; dense shrubbery along small stream, Okla., *E. L. Little, Jr.*, no. 128; wooded grassy glade in river-valley, Okla., *Hopkins*, no. 2943; wooded hills, Okla., *Goodman*, no. 2137; granite hills, Okla., *P. B. Sears*, no. 1317; dry sandstone ledges and boulders in oak-hickory forest, Okla., *Hopkins and Cross*, no. 1487; sandy soil, Okla., *V. Johnson*, no. 116; arid hillside, Okla., *M. Fielder*, April 20, 1927. The southwestern *P. hirsuta*, then, is evidently more calcicolous and less xerophytic than the southeastern *P. fallax*.

The Missouri dots for *Phacelia hirsuta* on McVaugh's map (his fig. 29) were presumably based on material of *P. gilioides* A. Brand (our PLATE 815, FIGS. 4–6). At least, all the Missouri specimens in the Gray Herbarium which were sent out as *P. hirsuta* are *P. gilioides*, a grayish or canescent plant with leaves cut into linear or linear-lanceolate segments, the stem and pedicels canescent-pilose without hirsute pubescence, the appressed calyx strigose, the corolla relatively small, its lobes undulate to dentate. It is P. GILIOIDES (misidentified as *P. hirsuta*) which Palmer & Steyermark assign in Missouri to "Rocky prairie, glades, ledges along bluffs, low rich woods, and alluvial ground along streams. Calciphile to circumneutral." The Oklahoma material in the Bebb Herbarium and the Gray Herbarium shows the following habitats: creek-bank, *Stevens*, no. 1377; prairies, *Robert Bebb*, nos. 3850 and 5090, *Ezra Brainerd*, April 12, 1908; prairies and wood-openings, *Robert Bebb*, no. 3884; woods, *Mrs. W. L. Ducker*, no. 39; shale, rocky mountain, April 6, 1941, *H. Randel Griffith;* rocky hills, *Robert Bebb*, no. 2720 and May, 1935, *J. E. McClary;* vacant lots and waste lands, *Auval H. Brown*, no. 18; cottonfield, April 19, 1927, *R. E. Jeffs*. Like *P. hirsuta*, it is also calcicolous and scarcely a xerophyte.

In *Phacelia dubia*[1] (PLATE 816) the sepals are unequal, the

[1] Although the combination *Phacelia dubia* (L.) Trel. is here credited to Trelease, it is done so under strong mental protest. The combination was published by Trelease in Branner & Coville, Ann. Rep. Geol. Surv. Arkansas for 1888, iv. 205 (1891)

outer ones usually broader and longer than the others. As the plant occurs through southeastern Virginia, the region best known to Clayton, thence northward into Pennsylvania, southward to southeastern North Carolina and west to the Blue Ridge and less frequently to Ohio, West Virginia and Tennessee its outer sepals are lanceolate to lance-oblong or -linear (FIGS. 1 and 2), sometimes slightly spatulate, the inner ones from lanceolate to linear. In mature fruit the lower and middle calices of each raceme are 4.5–7.5 mm. long and nearly to quite twice as long as the capsule; and the lower mature pedicels are 5–25 mm. long. About Nashville, Tennessee, and in Alleghany County, Virginia, there occurs an extreme (FIG. 4) of the species with the outer sepals ovate, the fruiting calyx only 4–5 mm. long, and the longer (lower) pedicels only 3–7 mm. long. Although small, it is not *P. dubia*, var. *georgiana* McVaugh, l. c. 158 (1943). That has narrow sepals and pinnate or deeply pinnatifid leaves, while the plant of Alleghany County and of the Nashville region has them shallowly lobed as in *P. dubia*, var. *dubia* McVaugh. I am calling the new plant

P. DUBIA (L.) Trel., var. **interior,** var. nov. (TAB. 816, FIG. 4), calycibus maturis 4–5 mm. longis; sepalis exterioribus ovatis; pedicellis imis maturis 3–7 mm. longis.—Western Virginia and north-central Tennessee. VIRGINIA: dry roadside, Covington, Alleghany County, May 12, 1916, *Hunnewell*, no. 4080. TEN-

as follows: *Phacelia* "*dubia* (L.), (*P. parviflora*, Pursh); Harvey." That was all. Disregarding the somewhat unusual punctuation and the fact that *Phacelia dubia* is unknown from so far west as Arkansas, Harvey's material being *P. hirsuta* Nuttall from near its type-locality, we have the fact that Trelease did not take the trouble to cite the basonym of *P. dubia*, which was *Polemonium dubium* L. Sp. Pl. 163 (1753)—a photograph of the TYPE before me. The combination *Phacelia dubia* (L.) Small in Bull. Torr. Bot. Cl. xxi. 303 (1894) was properly made, with correct citation of the basonym. Personally I should choose to cite Small as the correct author of the combination but I am assured that in doing so I should be too "literal". The easy-going good nature by which many slipshod combinations by Britton, Stern and Poggenberg, by Small (elsewhere) and by some in recent years, have been accepted as "validated" by the next author who correctly made them with proper bibliographic citations cannot strongly appeal to those who look upon nomenclature as a necessary implement of careful taxonomic work. When a combination is carelessly made and used for a species to which the unstated but loosely assumed basonym does not belong the errors become doubled. I have more than once protested the practice of taking up such combinations as validly published. The difficulty, of course, is that thousands and thousands of regularly used combinations of the earlier botanists were thus published. When we can again have International Congresses it may be a safeguard against such opportunist and inconsiderate publication to establish a dead-line after which no such combinations will be valid. If I am here I will work for such legislation! Since the adoption of the more recently clarified rules of botanical nomenclature there is no excuse for slipshod bibliography.

NESSEE: gregarious in open shrubberies and pastures or in open grounds, Nashville, April, 1878, *Gattinger* (TYPE in Herb. Gray.); barrens near Nashville, April, *Gattinger* as *Curtiss*, no. 2131.

One of Gattinger's specimens was called *Phacelia pusilla* Buckley in Am. Journ. Sci. xlv. 172 (1843). Buckley's species has generally been considered identical with *P. dubia*, but it came from Alabama and had the "sepals linear-oblong, acute", which certainly is not the case with var. *interior*. I have not seen Buckley's type but his description of the Alabama plant, with the pinnatifid leaves with obovate and abruptly acuminate segments and with linear-oblong, acute sepals 2/3 the length of the corolla, might well have been drawn from *Harper*, no. 82, from Elmore County, which is one of the paratype-collections of *P. dubia*, var. *georgiana* McVaugh. Some specimens, like one from Nashville, April, 1884, *Miss Cushman*, and Biltmore, North Carolina, *Biltm. Herb.* no. 786[b], are transitional between var. *dubia* and var. *interior*.

In *Phacelia dubia* the seed (FIG. 3) is rugose-reticulate, in *P. fallax* (PLATE 814, FIG. 4) transversely lineate-rugose.

Although McVaugh delimits his tabulation of plants occurring on granite flat-rock at the North Carolina-Virginia boundary,[1] his maps of ranges often extend farther north. In view of the abundance of *Phacelia dubia* on the Coastal Plain of Virginia (in Henrico, Prince George, Sussex, Southampton and Greensville Counties, and presumably the type-locality of Clayton) and McVaugh's correct reference to it on his p. 158 as "abundant in many parts of Virginia", it is difficult to interpret his map of the range of *P. dubia* which shows only 3 or 4 stations in the state, these all on the granites of the northwestern section of the state. The inclusion of the many stations 100–135 miles to the southeast would make a somewhat different picture, as would the inclusion of Newbern at the mouth of the Neuse in Craven

[1] Near the fall-line in southeastern Virginia there are two stations of special interest in connection with McVaugh's study of the flora of the granite flat-rocks farther south. *Cheilanthes lanosa*, which "is approaching here the eastern edge of its range" on the flat-rocks of central Georgia (long. about 82° W.), comes down to flat-topped granite rock at the fall-line in western Sussex County, Virginia, long. about 77° 35′ W. —see RHODORA, xlii. 383 and 404 (1940). "The longleaf pine (*Pinus palustris* Mill.) apparently does not occur on any of the actual outcrops, but is common in Heard County, Georgia, in the vicinity of the flat-rocks", etc. At its northern limit it is primarily a species of Coastal Plain sands but nearly 50 miles to the westward it has a small outlying colony on a low granite hill at the outer edge of the Piedmont in Brunswick County,—see RHODORA, xlv. 374–376 (1943).

County, North Carolina (specimen from *M. A. Curtis*) and of Wilmington at the mouth of Cape Fear River in southeastern North Carolina (see Wilmington Flora by Thos. F. Wood and Gerald McCarthy in Journ. Elisha Mitch. Sci. Soc. for 1885–'86, p. 131, as *P. parviflora* Pursh). In fact, M. A. Curtis, who intimately knew North Carolina, did not restrict *P. dubia* (or *parviflora*) to the 2 stations on the granitic belt of western North Carolina. By him it was not known from the mountains but was thought to be characteristic of the "Low Distr.", *i. e.* the Coastal Plain (see M. A. Curtis, Geol. and Nat. Hist. Surv. N. C., Pt. III. Botany, 42 (1867)).

Plate 814 is of Phacelia fallax, all figs. from the type: fig. 1, portions of plant, × 1; fig. 2, young inflorescence, × 3; fig. 3, portion of mature calyx, × 10; fig. 4, seed, × 10.

In plate 815, figs. 1–3 are of Phacelia hirsuta: fig. 1, type or isotype, × 1; fig. 2, portion of inflorescence, × 3, from northwestern Arkansas, *F. L. Harvey*, no. 12; fig. 3, seed, × 10, from Prescott, Arkansas, *Bush*, no. 258. Figs. 4–6, P. gilioides: fig. 4, plant, × 1, from Joplin, Missouri, *E. J. Palmer*, no. 1879 A (as *P. dubia*); fig. 5, young inflorescence, × 3, from same no.; fig. 6, seed, × 10, from near Muskogee, Oklahoma, *Robt. Bebb*, no. 3850.

In plate 816, figs. 1–3 are of typical Phacelia dubia: fig. 1, young inflorescence, × 3, from below Emporia, Virginia, *Fernald & Lewis*, no. 14,541; fig. 2, portion of mature inflorescence, × 3, from near Burgess Station, Virginia, *Fernald & Long*, no. 10,015; fig. 3, seed, × 10, from no. 10,015. Fig. 4, var. interior, portion of mature inflorescence, × 3, from type.

Hydrolea uniflora Raf. Aut. Bot. 34 (1840) must replace *H. affinis* Gray, Man. ed. 5: 370 (1867).

Rafinesque got hold of material without axillary spines, which is not unusual, both this glabrous species of the Interior and Southwest and the pubescent *H. quadrivalvis* Walt. having spines or not, the character variable. Likewise, the glabrous species may have solitary or glomerulate flowers. Rafinesque's description is unequivocal:

273, *Hydr. uniflora* Raf. caule flexuoso inerme glabro, fol. alt. lanceol. acutis subsessil. pedunc. axil. unifl. bract. 2 obl. ineq. cal. lin. glabris—Louisiana on Red River, sent me by Torrey as *Hydr. 4valvis*, but unlike the last, smooth, not spinose, leaves smaller, biuncial, flowers bluish white, anthers blue shaped like *x*, caps. bivalve

Lycopus amplectens Raf. Aut. Bot. 115 (1840). *L. europaeus*, var. *sessilifolius* Gray, Man. ed. 5: 345 (1867). *L. sessilifolius* Gray, Proc. Am. Acad. viii. 285 (1870).

There can be no doubt that Rafinesque had the plant known for three fourths of a century as *Lycopus sessilifolius*. His description is beyond dispute, for he restricted the genus to species with acerose teeth:

834, *Lyc. amplectens* Raf. glaber, caulib. virgatis simpl. angulis obt. fol. arcte sessil. subamplex. basi dilatatis oblongis acum. remote serratis, axilis nudis paucifl.—Alabama, pedal sesquipedal leaves uncial pale beneath, this sp. differs from all by obtuse angles and leaves not attenuate at base.

Setaria Faberii in eastern America.—In the summer of 1943 Mr. Bayard Long sent me for study a series of plants of the Philadelphia region which for some years had puzzled the field-botanists of that area. Sometimes forced unsatisfactorily into *Setaria viridis* (L.) Beauv. because of its dense green panicle; again occasionally shoved into *S. magna* Griseb. because of its great size, often nearly 2 m. high and sending up tall basal branches and with arching and flexuous panicles up to 1.7 dm. long, the latter soon dropping the ripe spikelets and becoming fuscous; and at other times unsuccessfully placed with *S. glauca* or even *S. italica*. Mr. Long became doubly suspicious of the identity of the plant with any of these species when, catching it with a beam of sunlight through the clump, he noted the rather conspicuous pubescence of the leaf-blades.[1] Such pubescence not occurring on the leaves of either *S. viridis, S. magna* or the other two, I tried in vain to make the material fit some tropical species with pilose leaves. Finally, I matched its spikelets and inflorescences in the recently described eastern Asiatic *S. Faberii* Herrm. in Rosen, Beitr. Biol. Pflanzen. x. 51 (1910), this Chinese species being there a weedy plant. About 20 years later *S. Faberii* was collected by Mr. Long in disturbed soil and rubbish along the Reading Railway in Philadelphia, September 9, 1931 (*Long*, no. 35,540). Since then it has been found "all over the lot" in eastern Pennsylvania, southwestern New Jersey and northern Delaware, in disturbed soils, on roadsides, in cultivated or fallow fields or even on tidal marshes. It has rapidly become a dominating and quickly recognized weed. In view of its weedy character in China, where noted only within the present century, the question of its native home arises. It may, like

[1] An incident in our Virginia field-work, often reported by our former companion, now Dr. Carroll Williams, is of our driving, at sunset, from Franklin toward Richmond at the maximum speed of that period, 60 miles an hour, when suddenly Long shouted: "Stop, stop, Carroll. That *Paspalum* has pubescent spikelets!" Surely enough, when Long returned from the colony, 50 (now stretched to 100) feet away, he showed by the light of the car the minute pilosity on the tiny spikelets. A vivid beam of light from the setting sun had given the inflorescence of the *Paspalum* a distinctive sheen.

Eragrostis peregrina and several other species, be always a seeming adventive.

Shown the distinctive characters, Mr. Carroll E. Wood returned for a time to his home in Roanoke County, Virginia. As he at first wrote me "it seems to follow me wherever I go". Subsequently he has altered this view. He sends me beautiful material from roadsides and fields of Roanoke and Botetourt Counties, Virginia, collected in October, 1943, the plant there abundant. He writes, however, that the plant, there "abundant and quickly recognized from the moving automobile", could not be traced into adjacent Rockbridge, Augusta and Albemarle Counties, where *S. viridis* abounds. Finally (for the moment) Rev. Frank Seymour brings me for identification a specimen, collected by him on a roadside in Lancaster, Massachusetts, in September, 1943.

Setaria glauca is at once distinguished from our other annual species by having each spikelet subtended by 5–20 bristles, our other species having but 1–3 bristles; while *S. italica* has the yellow to red or blackish grain dropping free from the spikelet. The three species with 1–3 bristles and with the green to stramineous or buff grain tightly embraced within the falling spikelet, *Setaria viridis, S. Faberii* and *S. magna,* may be distinguished as follows.

a. Panicle only obscurely if at all lobulate, erect or but slightly arching, 1–17 cm. long, 0.5–3 cm. thick; grain rugose or cross-wrinkled; leaves 2–17 mm. wide.
- Panicle erect or straightish, 0.5–2.3 cm. thick; spikelets 1.8–2.5 mm. long; grain slightly rugose; leaves 2–15 mm. wide, glabrous . . . . *S. viridis.*
- Panicle flexuous to strongly arching, 2–3 cm. thick; spikelets 3 mm. long; grain distinctly cross-wrinkled; leaves 8–17 mm. wide, minutely pubescent beneath, strigose above . . . . *S. Faberii.*

a. Panicle conspicuously lobulate, arching or drooping, 0.8–6 dm. long, 2.3–7 cm. thick; grain smooth; leaves 1–4 cm. broad, glabrous . . . . *S. magna.*

Setaria Faberii will doubtless be found in many herbaria, confused with the other species.—M. L. Fernald.

The so-called Keeled Garlic of Eastern Pennsylvania. —In 1901 the late N. L. Britton recorded in his Manual, 1046, as "**Allium carinatum** L. Keeled Garlic", a plant which had appeared in Bucks County, Pennsylvania. In 1912 Mr. Bayard Long called attention to the occurrence, spread and characters of the Pennsylvania plant. This note was a brief one, in a report of a meeting of the Philadelphia Botanical Club in Bartonia, no. 5: 18 (1912). Two years later he published in Bartonia, no. 7: 6–16 (1914) a very detailed account of the plant in eastern Pennsylvania, in which he took exception, on many points, to the descriptions by Britton and to the illustration in Britton & Brown, Ill. Fl. ed. 2, i. 499, fig. 1247 (1913). Mr. Long's numerous corrections of the descriptions and illustration (just cited) are readily available. They need not here be repeated, although, in summary, they included the growth-habit, weak stem, spiraling or twisting of the flattened- and hard-tipped leaves, and the yellow-brown and green-suffused perianth about equaling the stamens. These characters, derived from accurate field-knowledge of the naturalized plant of eastern Pennsylvania, were in strong contrast with characters as given in the descriptions by Britton and the illustration in Britton & Brown: stamens long-exserted and "flowers . . . violet or rose".

When I came to this species in a recent study of *Allium* the reason for Mr. Long's finding the most significant characters of the Pennsylvania plant at variance with the Britton account became evident. Dr. Britton, instead of describing and accurately illustrating the Pennsylvania material, had followed up an original misidentification of it by taking from European sources the distinctive characters of European *A. carinatum.* This has caused perpetuation of an error, for the Pennsylvania plant, so clearly described by Mr. Long, is the common and generally recognized *A. oleraceum* L., one of the species known in Britain as Wild Garlic. The English name "Keeled Garlic", presumably not really used by the common people of Europe, no longer applies. What the "colloquial" name of the Pennsylvania plant may be, since it is *A. oleraceum*, not *A. carinatum*, I do not know. It is presumably not "Esculent Garlic". That the plant of eastern Pennsylvania is *A. oleraceum*, not *A. carina-*

tum, should be evident from the characterization of the two in Regel, Alliorum adhuc cognitorum Monographia (1875).

"170. *A. oleraceum* L. . . . sepalis oblongo-lanceolatis, obtusis v. subacutis; filamentis . . . perigonium subaequantibus . . . Folia . . . compresso-planiuscula, apicem versus saepe plana . . . Sepala rosea, albida, fusco-viridia v. lurida v. lurido-virescentes", etc.

"171. *A. carinatum* L. . . . folia lineari-canaliculata v. plana . . . , . . . ; sepalis ovato-oblongis, apice truncato-obtusis concavisque; filamentis . . . perigonium paullo-duplo superantibus; . . . Sepala . . . rosea v. violacea v. atroviolacea . . .
Sepalis obtusioribus apice conniventibus filamentisque perigonium superantibus a specie praecedente [*A. oleraceum*] diversum."

Again, Rouy, Fl. Fr. xii. 364, 365 (1910) separates, in the primary divisions of his key, *A. carinatum* and *A. oleraceum* as follows: "Etamines nettement saillantes, exsertes au moins du quart de la longeur du perigone", this leading to "Fleurs roses ou violacées" and to *A. carinatum*, etc.; "Etamines incluses, ou égalant env. le perigone", this leading directly to *A. oleraceum* with (p. 369) "*feuilles . . . tres rudes en dessous*" and in the typical form (his subvar. *virens*) "Fleurs verdâtres ou blanchâtres teintées de vert et de rose".

Although, as quoted by Long, l. c. 7, Dr. Britton thought that his illustration of a single flower, with round-tipped sepals and long-exserted stamens, had been drawn from a Pennsylvania specimen, it is not unlikely that it, like the description, was from a European source.—M. L. Fernald.

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THE AMERICAN VARIETY OF SAXIFRAGA AIZOON

Fred K. Butters

(Plate 817)

Saxifraga Aizoon Jacq. is the only American representative of the essentially European section *Euaizoonia* (the genus *Chondrosea* of Haworth). According to the treatment of Engler and Irmscher[1], this section contains 10 species all of which occur in the mountains of central and southern Europe. Eight of the species are confined to more or less restricted areas of this region; *S. Cotyledon* L. occurs also in western and northern Scandinavia and in Iceland, while *S. Aizoon* has a truly remarkable range: all the central European mountains from the Pyrenees to the Carpathians; southward to Corsica, in the Apennines to the latitude of Naples, and to the mountains of northern and central Greece; eastward to Asia Minor, Armenia and (as the subspecies *cartilaginea*) to the Caucasus; two restricted districts in Scandinavia[2]; Iceland[3]; East Greenland to latitude 71° 20′ N., West

[1] Das Pflanzenreich, IV, 117 (1919).

[2] *S. Aizoon* is very rare in Scandinavia, occurring only in two widely separated districts: 1. the Ryfylke east of Stavanger in southeastern Norway in latitude 59° 25′; 2. in the mountains east of Saltdal in latitude 67°, where it occurs on both sides of the boundary between Norway and Sweden. There is a considerable Scandinavian literature in reference to this plant, from the standpoint both of its taxonomy and its plant-geography. See Neuman, L. M. Bidrag till Kännedomen af floran vid Saltenfjord och på Sulitälmaområdet i Norge. Botaniska Notiser 1905, p. 263, where he described the northern plant as a new subspecies, *S. Aizoon* Jacq. **Laestadii* L. M. Neuman (a name completely ignored by Engler and Irmscher); Dahl, Ove, Botaniske undersøgelser i indre Ryfylke, Forhandlinger i Videnskabs-selskabet i Christiania 1906, no. 3 (p. 35) and 1907, no. 4. (p. 34), where the occurrence of the more southerly plant is discussed, and a new form is described; Nordhagen, Rolf, Om *Arenaria humifusa* Wg. og dens betydning for utforskningen av Skandinavias eldste floraelement, Bergens Museums Årbok 1935 Naturvidenskapelig rekke Nr. 1 (pp. 125, 135,

Greenland to latitude 74° 31′; Baffin Island to latitude 73°; Newfoundland; and on the continent of North America from northernmost Labrador to northern Vermont and westward to Hudson Bay, the Lake Superior region, and apparently to the Saskatchewan Valley and Great Slave Lake. It does not occur anywhere in the Rocky Mountains or westward.[4]

As early as 1830 this extraordinary range caught the attention of students of phytogeography. Ernst H. F. Meyer makes the following observation: "On account of the singular geographical distribution I had suspected that the American and Icelandic plant differs from the Austrian and Swiss species until a sedulous examination of Greenland specimens taught me the contrary."[5]

---

163); Skandinavias fjellflora og den relasjoner till den siste istid, Nordiska (19, skandinaviska) naturforskarmötet i Helsingfors 1936, pp. 93–124.

[3] Engler and Irmscher say, "Auf Island und den Faeröen fehlend." This is certainly erroneous in so far as it concerns Iceland. There is an Icelandic specimen in the Gray Herbarium, and Ostenfeld and Gröntved say in their Flora of Iceland and the Faeroes, "Icel. rare, found in a few places of the N.E, and SW"

[4] I have seen no specimens from west of Lake Superior. It is reported from Shoal Lake, Manitoba (just north of Lake-of-the-Woods) in the Check List of Manitoba Flora, published by the botanical section of the Natural History Society of Manitoba, in 1922. The reports of its occurrence in "Saskatchewan" go back to Hooker's Flora Boreali-Americana and are undoubtedly authentic, though the exact extent of the country covered by this term in 1834 is somewhat doubtful. Its occurrence in the North-west Territories about Great Slave Lake is reported by Nicholas Palunin in his Botany of the Eastern Arctic, Polunin having presumably taken his record from Raup's Phytogeographic Studies in the Athabaska-Great Slave Lake Region.

There is one report of this species from the Canadian Rocky Mountains, quite definitely erroneous. In his *Phytogeographic Studies in the Peace and upper Liard River Regions, Canada* (Contrib. Arnold Arb. 6, 170), H. M. Raup cites without comment an old report by John Macoun of its presence at the foot of Mt. Selwyn, at the west end of Peace River Pass, Macoun's plants, collected on this occasion, were lost. An examination of the original record (*Canadian Geological Survey; Report of Progress 1875–76*) indicates that the origin of this report was probably a *lapsus calami* on Macoun's part. On p. 146 of the report, in his account of the climb of Mt. Selwyn, he speaks of stopping at the banks of a stream at the foot of the mountain and collecting "Saxifraga oppositifolia, rivularis and Aizoon" and a half dozen other plants. This is the only mention of *S. Aizoon*. It does not appear on p. 148 in the systematic list of the plants collected on Mt. Selwyn (all the other plants mentioned on p. 146 are in this list), nor is it included in the long appendix (pp. 186–232) which includes all the plants collected by him "in the summers of 1872 and 1875 in the Saskatchewan country and on the Peace River, also on the Rocky Mountains in British Columbia and Vancouver Island." Furthermore he does not include this locality for *S. Aizoon* in his *Catalogue of Canadian Plants* published seven years later. It appears almost certain that in the single place where "Aizoon" occurs it was written by mistake for "aizoides", a species which appears in all the above mentioned lists, and which might well occur in the sort of place he is describing.

[5] Meyer, Ernesti, De Plantis Labradoricis Libri Tres. Leipsig. 1830. Quam ob singularem distributionem geographicam plantam Americanam atque Islandicam ab Austriaca atque Helvetica specie differre suspicatus eram, donec specimina Groenlandica sedulo examinata contrariam me docuerunt.

Four years later W. J. Hooker[6] states: "The [American] specimens differ in no respect from those of Europe". Following such categorical statements it has been customary to regard the American plant as completely identical with the European species or even to identify it with certain European subspecific groups.

The European plant is extremely variable in many respects, so much so that Engler and Irmscher designate the species as a "typus polymorphus" and recognize two subspecies, 18 varieties, 8 subvarieties, and 11 forms, a considerable number of which have at one time or another been described as species. They say "hujus typi polymorphi varietates et formae difficile extricantur", and further that they have found the leaf-form and serrature to be the most reliable characters. They identify the American forms with certain central European ones, saying for the plant of Baffin Island "ausschliesslich var. *montana* sub var. *subaffinis*" and for the plants of Greenland and subarctic America, "ausschliesslich var. *montana* subvar. *recta* und subvar. *subaffinis*."[7]

Despite this unanimity of botanical opinion concerning the status of the American plant there are certain small but real differences between it and all the European forms that I have seen. The seeds of the species are about ¾ mm. long, somewhat ridged, and minutely verrucose. The papillae are well seen only under a compound microscope. Those of all European plants examined are crowded, covering all parts of the seed quite uniformly, and when seen in profile appear as steep-sided domes 8–10 μ high (PLATE 000, FIGS. 4 and 5). The papillae in the American plant are only about half as high, with more gradual slopes, less crowded and on parts of the seed, particularly between the ridges, they may be almost or quite obsolescent (FIGS. 9, 10 and 11). Probably on account of these differences in the papillae, perfectly ripe American seeds often appear somewhat glossy, while the European ones are always dull.

Another difference which appears to be diagnostic is in the

[6] Flora Bor.-Am. 1, p. 243 (1834).

[7] Engler & Irmscher, loc. cit. pp. 501 and 502. Their names for these European forms are not in accordance with the International Rules, since the oldest *varietal* name seems to be *S. Aizoon* β *recta* Ser. ex D. C. Prodromus iv. p. 19 (1830). At least it antedates their newly coined var. *montana* by 89 years.

configuration of the stomium of the dehisced capsule. In the European plant the edges of the beaks along the line of dehiscence are relatively thick, while outside the opening thus defined are somewhat vague folds. In the American plant, on the other hand, the separating edges of the carpel-beaks are relatively thin, while a thick and definite cord runs down each side of each beak and unites with the corresponding cord of the other beak to form a distinct outer frame about the stomium (FIGS. 2, 3, 7, and 8).

Besides these characters, which appear to be entirely consistent, there are a number of tendencies which, while usually giving a characteristic appearance to the American plant, are not sufficiently distinct to separate it sharply from the European. The leaves of well developed plants have much the same shape as in the European var. *recta* but with a little greater tendency to be somewhat cuneiform. However in poorly developed rosettes of normal plants and in the depauperate plants of colder habitats the leaves tend to be obovate-cuneate to nearly elliptic, quite different from the short linguiform leaves of the corresponding European subvar. *subaffinis* and approaching those figured by Engler and Irmscher[8] for var. *typica* subvar. *brevifolia.*

In general the leaves of the American variety seem to be thicker than those of the European ones. In herbarium material of the European plant it is often possible to observe the entire vein-system of a leaf by holding it up in front of a strong light. In no case does this hold for the American plant.

The inflorescence in well developed European plants usually has widely spreading branches which curve upward from an almost divaricate base. In the American plant the branches of the inflorescence are more ascending, and the whole panicle denser in consequence.

In the American plant the cauline leaves tend to be larger and more numerous than in the European. There are a good many exceptions to this, but in looking through large collections of the two, one is struck by the greater leafiness of the American specimens.

There is a strong tendency for the fruiting ovary of the American plant to be better developed above the insertion of the sepals,

[8] Ibid. p. 490.

and for that of the European plant to be better developed below this level. This character differs considerably among the various individuals in a single collection, and again there is considerable overlapping. All attempts to reduce it to a mathematical formula have broken down, chiefly through difficulties in getting comparable measures of the beaks of the carpels. These differ so much from plant to plant in degree of curvature, amount of splitting on dehiscence, and length of styles and stigmas that it has proved impossible to find any datum-plane that does not introduce too large errors of measurement. The base of the fruit also is often rather indefinite, particularly in the American plant. Despite these difficulties, it is evident on examining a large number of American plants, that the top of the fruiting ovary usually overtops the sepals rather conspicuously, while in the European plant it is generally pretty much concealed by them.

In view of these tendencies, and the two diagnostic characters of fruit and seed it seems that the American plant should be considered as a variety distinct from all the European varieties, which I am calling var. **neogaea**[9]. All the American specimens examined belong to this variety, also all those from Greenland, and the single specimen seen from Iceland. Unfortunately no Scandinavian specimens have been seen, and it is impossible to say whether the plants of Scandinavia are most closely related to the New World variety or to the plants of southern and central Europe[10].

[9] Saxifraga Aizoon Jacq. var. neogaea, var. nov. Var. *rectae* Ser. ex D. C. (var. *montanae* Eng. & Irmsch.) similis sed seminibus laevioribus papillis minus altis et minus crebris, fructuum partibus superioribus exsertis, stomiis margine tenui restibusque lateralibus prominentibus instructis. Type (in herb. Minn.). *Butters, Burns and Hendrikson* no 52, cliff south of Mountain Lake, Cook Co., Minnesota.

[10] The plants from the two Scandinavian localities are not alike, and Nordhagen has shown that the differences are genetic, by growing them in pots side by side (see photograph in his 1936 paper, p. 107). The northern form (subsp. *Laestadii* Neum.) is described as very dwarf, with elliptic or obovate basal leaves and almost capitate cymes (the axis of the inflorescence 0–5 mm. long, the pedicels equalling the flowers or shorter). The petals are described as yellowish, with rose-colored dots, erect or semi-erect in anthesis. Nothing like this appears to occur in America. The southern form is larger but quite variable in stature, the flowers flat and varying from greenish yellow to milk-white with red dots and stripes. It is said to be intermediate between subsp. *Laestadii* and the central European forms. Nothing is said concerning the fruits and seeds of either form.

Nordhagen is convinced that the northern station represents a survival through the last glacial period a little to the west of its present locality. Concerning the southern station he is uncertain whether the plant is a relic or whether it represents an invasion from Denmark or the "North Sea Continent" at the close of the last glaciation.

As is the case with several of the European varieties, var. *neogaea* occurs in two confluent forms. In the southern part of its range, and occasionally even in the far north the usual form has the leaves of the mature rosettes linguiform and 1.5–4.5 cm. long, the flowering shoots (7–) 10–30 (–45) cm. tall and the many-flowered inflorescence paniculately branched. This I regard as typical var. *neogaea*.

On the other hand, in the colder parts of its range there is a form with obovate-elliptic basal leaves 7–12 mm. long, flowering branches only 2–12 cm. high, and the inflorescence few-flowered and short, sometimes nearly capitate. There are no differences in flowers, fruits or seeds.

The extremes of these two forms are very different in appearance, but they pass into one another by insensible gradations, and leaf-form and inflorescence-height do not entirely corellate. Moreover the same small, rounded leaves are sometimes seen in young rosettes of the tall form, and occasional depauperate individuals closely simulating the dwarf northern plant occur along with the normal form even at the southern limit of its range. The two forms are probably purely ecological, and their geographical distribution merely an expression of the climatic differences in the habitats, but it is possible that, as in the case of the two Norwegian forms, culture under similar conditions would disclose some real genetic differences. Engler and Irmscher treat similar pairs of European forms as subvarieties. However until the dwarf form can be proved to be more than an ecological response to a cold climate and unfavorable growing conditions it seems better to treat it as a form[11].

All specimens seen from Vermont, the Lake Superior region, and Canada south of the St. Lawrence River belong to typical var. *neogaea*, though occasional depauperate individuals occur in several of the collections. From farther north, the following may be considered typical var. *neogaea* or at least as containing some quite typical individuals[12]. Northern Quebec: Ile St.

[11] Saxifraga Aizoon Jacq. var. neogaea forma **frigida**, forma nov., foliis rosularum ellipticis vel obovato-spathulatis 7–12 mm. longis, caulibus 2–12 cm. altis, inflorescentia brevi corymbosa pauciflora. Type (in herb. Minn.) *E. C. and Lucy B. Abbe and J. Marr*, 3860. Hill at Boat Opening, Manitounuk Sound, Quebec.

[12] In these northern collections there are more depauperate individuals than in collections from farther south, and in ample collections there is usually a complete gradient from the largest, typical specimens down to dwarf individuals which must be considered as forma *frigida*. As an example may be cited the collection from Beach

Genevieve, Mingan Islands *Ff. Marie-Victorin et Rolland-Germain* 18793 (G)[13]; calcareous tableland east of Blanc Sablon, *Fernald and Wiegand* 3524 (G); Beach Creek, Richmond Gulf, *Abbe and Abbe* 3249; Old Factory River, *W. G. C. Todd* Aug. 3, 1912 (P). NORTHWEST TERRITORY: Tukarak Island, Belcher Islands, Hudson Bay, *Abbe, Abbe, and Marr*, 4008. NEWFOUNDLAND: Tilt Cove, Northern Shores of Notre Dame Bay, *Fernald and Wiegand* 5520 (G). LABRADOR: September Harbor, *Harlow Bishop* 354 (G). GREENLAND: Neria (61° 30′ N.) *I. Eugenius*, Sept. 2, 1925, July 31, 1926 (G); Disko, Godhavn (69° 14′ N.) *A. E. Porsild*, Sept. 10–20, 1922 (G); Amitsuatsiaq Fjord (70° 45′ N.) *M. P. & R. T. Porsild* July 10, 1929 (G) (the tallest plant 23 cm. high); Uníarfic Fjord (71° 56′ N.) *M. P. Porsild*, Sept. 7, 1934 (G).

The following collections may be cited as *S. Aizoon* var. *neogaea* f. *frigida*. NORTHERN QUEBEC: Baie des Moutons, *H. St. John* 90509 (G); Blanc Sablon, *M. T. Doutt* June 25, 1939 (P); Great Whale River, *E. C. & Lucy B. Abbe* 3934; Boat Opening, *Abbe, Abbe and Marr* 3860; Port Harrison, *Mrs. G. K. Tallman*, Aug. 7, 1936. NORTHWEST TERRITORY: South Twin Island, James Bay, *M. T. Doutt* 2292 & 2347 (P); Goose Id., Belcher Ids., *J. K. Doutt* 218 (P); Tukarak Id., Belcher Ids., *J. K. Doutt* 209 & 309 (P). LABRADOR: Cape Mugford, *W. E. C. Todd*, Aug. 2, 1920 (P); 20 mi. north of Nakvak, *H. S. Forbes*, Aug. 28, 1908 (G); Rama, *J. D. Sornborger* 37. NEWFOUNDLAND: Fishing Head, St. Anthony, *E. C. Abbe* 425; Chimney Cove, *A. C. Waghorne*. BAFFIN ISLAND: Lake Harbour, *M. O. Malte* 121037 (G); *N. Palunin* 429 (G); Griffen Bay, *David Potter* 8104 (G). GREENLAND: Disko (69° 15′ N.) *Aa. Jensen*, 25 July 1936 (G); Safiorfik (72° 23′ N.), *Ussing*, 22 July, 1886 (G). ICELAND: Hrethavatn, *Edith Scamman* 1407 (G).

That *Saxifraga Aizoon* originated in the mountains of southern or central Europe seems certain in view of the large number of related species in that region, and also the great variability of *S. Aizoon* itself there. The North American population must have reached this continent by a trans-Atlantic route, presumably by way of Scandinavia, Iceland and Greenland. At least,

Creek, Richmond Gulf, *E. C. and Lucy B. Abbe* no. 3249 This collection contains 44 flowering specimens. The flowering shoots range from 6.5–21 cm. in height, forming an unbroken series between these extremes. The leaves also vary continuously from elongated linguiform in the large specimens to short-elliptic in the smallest ones. The largest specimens are typical var. *neogaea*, the smallest forma *frigida*.

[13] Through the kindness of the Curators of the Gray Herbarium and of the Herbarium of the Carnegie Museum, Pittsburgh, I have been able to examine a large number of sheets from these institutions. In the following list they are indicated with (G) and (P) respectively; those in the Herbarium of the University of Minnesota are not marked.

if it traversed the British Isles and the Faroes all traces of its presence there were obliterated by the last glacial advance. Its wide distribution in northeastern North America implies a fairly early arrival in the western hemisphere, certainly not later than some of the mid-Pleistocene interglacial periods. On the other hand, a Tertiary invasion seems unlikely in view of its failure to reach the Cordilleran region, or the Canadian West-Arctic. The stock that reached North America must have been genetically pretty uniform since one of the remarkable characteristics of the American population is its uniformity except in such characters as are directly correlated with more or less favorable habitats. This uniformity of the American population argues in favor of an interglacial, rather than a Tertiary invasion of North America, as, in a species which is so extremely variable in Europe, some mutation and division into geographical races would be expected in North America if the plant had been resident here during the whole of the Pleistocene.

The species probably survived the Wisconsin glaciation in numerous refuges. It is almost ideally adapted for survival on a nunatak-area of even rather limited size. One of its most remarkable characters, moreover, is the vigor and speed with which it has occupied suitable sites in the center of the glaciated tract, far from any possible center of survival, Its occurrence on the islands in Hudson Bay is a striking example, for these islands were not only heavily glaciated, but for an indeterminate time after the Wisconsin glaciation they were submerged by the waters of the Bay. In this respect the behavior of the species in North America is in sharp contrast to its behavior in Scandinavia.

In northeastern Minnesota it occurs quite abundantly in Cook Co., on north-facing slate cliffs in a region where the Wisconsin glaciation was apparently confined to valley glaciers pushing into the upland from the main ice-lobe in the Lake Superior basin. One can see no reason why it may not have continued *in situ* since the last interglacial period.

Explanation of Plate 817

Figs. 1–5, Saxifraga Aizoon, var. recta from "Transsilvania occidentalis. Biharia. in montibus ad Vidram", *Simkovics Fl. Exsicc. Austro-Hungarica*, No. 1290 (distributed as *S. robusta* Schott, Nyman et Kotschy, cited by Engler and Irmscher as *S. Aizoon* var. *montana*): fig. 1, inflorescence, × ½;

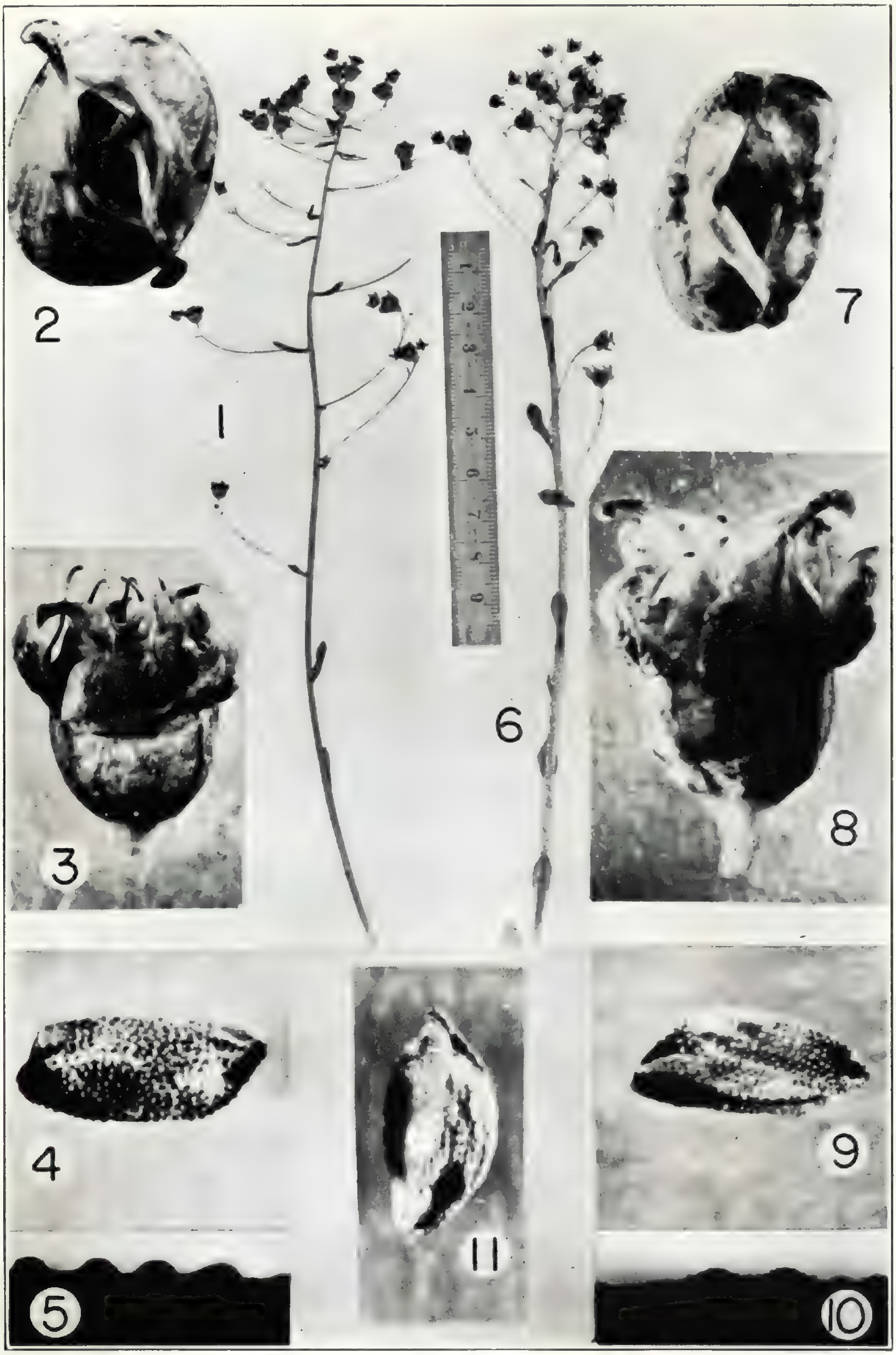

Photo. E. C. Abbe.

Saxifraga Aizoon var. recta, from Transsilvania: fig. 1, inflorescence × ½; fig. 2, ripe capsule from above × 8; fig. 3, ripe capsule from side × 6; fig. 4, seed × 30: fig. 5, sculpturing of seeds × 225.

Var. neogaea, from type: fig. 6, inflorescence × ½; fig. 7, ripe capsule from above × 8; fig. 8, ripe capsule from side × 6; fig. 9, seed × 30; fig. 10, sculpturing of seed × 225.

Var. neogaea f. frigida: fig. 11, seed × 30, from Great Whale River, Quebec.

FIG. 2, ripe capsule from above, × 8; FIG. 3, ripe capsule from side, × 6; FIG. 4, seed, × 30; FIG. 5, detail of sculpturing of seed, × 225.

FIGS. 6–10, S. AIZOON, var. NEOGAEA, type, University of Minnesota, from Mountain Lake, Cook Co., Minnesota, *Butters, Burns and Hendrickson*, no. 52: FIG. 6, inflorescence, × ½; FIG. 7, ripe capsule from above, × 8; FIG. 8, ripe capsule from side, × 6; FIG. 9, seed, × 30; FIG. 10, detail of sculpturing of seed, × 225.

FIG. 11, S. AIZOON, var. NEOGAEA, f. FRIGIDA from Great Whale River, Quebec, *Abbe and Abbe*, no. 3934; seed, × 30.

NOTES ON THE FLORA OF ROANOKE COUNTY, VIRGINIA[1]

CARROLL E. WOOD, JR.

A FEELING akin to both chagrin and indignation used to come over me upon seeing range-maps of various plants in botanical journals and seeing Roanoke County, the area with which I am most familiar, seemingly ignored. In almost every instance, this western Virginia county is represented, not by a black dot, but by a large white void, as though it were an unexplored area. It soon became apparent that it was, indeed, a botanical blank: that few collectors had ever visited the area, and as a result it is practically unrepresented in the larger herbaria. This is somewhat surprising, for the region is easily accessible, a wide variety of habitats is present within an altitude-range of 3000 feet and the location of the area is such that floral elements of several types are intermingled, producing an area of unusual phytogeographical interest. A spring, a fall, and a summer of intensive collecting have proved the county indeed worthy of attention and have filled the blank for almost a thousand plants, many of which were to be expected, but some of which were distinct surprises or even novelties. At the present time at least 1025 species and varieties of vascular plants (including approximately 150 introduced species) are known to me from Roanoke County, and it is quite certain that there are many more as yet uncollected. Some of the more interesting plants are worthy of record and these will be noted presently.

Roanoke County is located at the lower end of the Shenandoah Valley in west-central Virginia, the main valley highway, Route

[1] The records included here are taken from a thesis accepted by the faculty of the Graduate School of Arts and Sciences of the University of Pennsylvania, January, 1943, as partial fulfillment of the requirements for the degree of Master of Science.

11, approximately bisecting it. It is roughly pentagonal in shape and includes 305 square miles, being thus somewhat smaller than the surrounding counties. The chief city, Roanoke, an industrial and railroad center with a population of about 70,000, lies on the Roanoke River in the large central lowland, Roanoke Valley, which extends completely across the county, a distance of twenty miles. Salem, the county seat, eight miles west of Roanoke, and Vinton, adjoining Roanoke to the east, are the only other communities of any considerable size, the rest being small and scattered villages. The residual soils of the valley, resulting from the erosion of limestone and dolomite, are fertile and widespread and have played a large part in the human history of the area. The rolling valley-floor, about 1000 feet above sea-level, is accordingly intensively cultivated and little forest remains there.

In spite of the central lowland, the region is essentially mountainous, including parts of the *Blue Ridge* and *Appalachian Valley and Ridge Physiographic Provinces.* The mountains rise to 3000–4000 feet above sea-level and were formerly covered with magnificent deciduous forest. None of the original forest remains, however, having been replaced by second-growth woods as a result of extensive lumbering operations and fires. The latter have not been frequent in recent years but formerly played a large part in the reduction of the forested areas.

The southern third of the county, south and east of Roanoke Valley, is an upland formed by the Blue Ridge and its foothills. Most important are Bent and Poor Mountains, parts of which form a plateau with an elevation of about 3000 feet. The great mass of Poor Mountain rises some 2500 feet above the valley-floor to an altitude of 3960 feet, the highest point in the county. This is the most rugged part of the area and is sparsely settled and poorly developed. Rainfall is slightly greater than in other parts and conditions are more suitable for plants of northern affinity, which, indeed, seem to occur here more frequently than elsewhere in the county.

The northwestern third, on the other hand, consists of parallel northeast-southwest mountains with the narrow intermontane valleys so characteristic of the Valley and Ridge Physiographic Province. The long, narrow, even-crested ridges of resistant

sandstone, notably Fort Lewis and Catawba Mountains, rise above the valleys to elevations of about 3000 feet with scattered points somewhat higher. The valleys are cultivated, but the ridges are generally untouched.

The Blue Ridge portion of Roanoke County is occupied chiefly by Pre-Cambrian crystalline rocks (gneisses and schists) which weather readily, producing a heavy, red soil. The central and northwestern parts, however, are mainly sandstones, limestones and shales of Palaeozoic age, including more than twenty formations ranging from Lower Cambrian to Lower Mississippian. A great fault along the western edge of the Blue Ridge marks the dividing line between the two areas.

With the exception of the extreme northern portion tributary to the James, drainage is almost entirely into the Roanoke River which rises in Montgomery County to the west, traverses Roanoke Valley and, breaking through the Blue Ridge at the eastern boundary of the county, flows southeastward across Virginia, finally emptying into Albemarle Sound in North Carolina. The river has cut down varying depths below the valley-floor—about 700 feet at the west and 50 at the east—and the erosion of the comparatively soluble limestones has resulted in the formation of steep bluffs and cliffs in places, providing distinctive habitats for calciphilous plants.

The diversity of relief coupled with the wide range of geologic formations provides many different types of habitat, ranging from limestone cliffs and rich, wooded bluffs to sterile, acid slopes supporting an ericaceous flora to shaly areas yielding such plants as *Clematis albicoma* var. *coactilis*, *Senecio antennariifolius*, and *Brauneria laevigata*. Ponds and lakes are absent from the region, but the shores of Roanoke River and its tributary streams provide limited aquatic habitats, and two marshes in Roanoke Valley fed by limestone springs (with which the region is abundantly supplied) have yielded a number of interesting plants among which *Hibiscus palustris* is most conspicuous. Bogs are unfortunately lacking; *Sphagnum* is practically unheard of in the county, having been found thus far only in a small pond-hole at the base of Fort Lewis Mountain north of Salem. Of some interest is a fenster of Clinch sandstone, Round Hill, which rises a hundred feet above a limestone region just north of the

city of Roanoke. Although absent from the surrounding neutral area, plants of acid soils occur on this "island," as might be expected.

As previously noted, Roanoke County has, with few exceptions, been untouched botanically. Apparently not many more than eighty species have been recorded from this area in the literature and these records are mostly the result of collections made by members of the Torrey Botanical Club at Roanoke in 1890, 1891, and 1892.

In the late spring of 1890, Dr. and Mrs. N. L. Britton, accompanied by Addison Brown, Thomas Hogg, Anna Murray Vail, and Millie Timmerman (now Mrs. H. Ries), stopped for an afternoon at Roanoke and after riding to the end of the trolley-line, walked towards the Roanoke River, stopping to collect on the limestone bluffs. As a result of these collections *Clematis Addisonii* and *Penstemon canescens* were named by Britton and some fifty species were reported by Miss Vail in her account of the trip.[1] The next year J. K. Small and A. A. Heller spent a day on the river-bluffs and noted twenty-six species[2] half of which had not been found by the preceding party. Small, Miss Vail and others again visited the locality in 1892 and, although they found the hill mostly quarried away in the construction of streets, reported thirteen species[3], nine not previously noted. This locality is now completely covered by the city and some of the seventy species have not since been found elsewhere in the county. A few additional scattered records of casual collections have been published, but the accounts of these three trips comprise the bulk of botanical data concerning Roanoke County, Virginia.

In recent years a few botanists have passed through the area and specimens may be found in various herbaria. Dr. P. M. Patterson has accumulated a small herbarium at Hollins College near Roanoke and a number of sheets from the eastern part of the county are to be found there, while at Roanoke College in Salem there is a small collection of vernal species. Dr. Patterson and Professor G. G. Peery have kindly permitted me to check

[1] Mem. Torrey Bot. Club 2: 27–53. 1890.
[2] Ibid., 3: 1–39. 1892.
[3] Ibid., 4: 92–202. 1893–94.

through their respective herbaria and some of these records are included here.

The bulk of the species is represented by my collections in 1940, 1941 and 1942, fifty years after the Torrey Club visits, comprising approximately 3000 numbers from all parts of the county. The majority of these specimens are in the Herbarium of the University of Pennsylvania, but a number have been distributed to other institutions, notably the Gray Herbarium and the Academy of Natural Sciences of Philadelphia. In the notes which follow, these herbaria are designated by appropriate letters: A, Academy of Natural Sciences of Philadelphia; G, Gray Herbarium; P, University of Pennsylvania. Collection-numbers unless otherwise noted are my own.

I am greatly indebted to the many people who have made this paper possible and would like to express here my appreciation for their favors. I am particularly grateful to Dr. John M. Fogg, Jr., to Dr. Edgar T. Wherry, and to Mr. Bayard Long who have been most cooperative and helpful with the more difficult groups and with the problem as a whole. Professor M. L. Fernald has seen some three hundred of my specimens, has kindly advised me as to the identities or relationships of some of these, and has called to my attention several nomenclatural matters.

The species here enumerated represent for the most part range-extensions, new occurrences of rare plants, recently developed colonies of unusual weeds, etc.

Dryopteris Thelypteris (L.) Gray, var. pubescens (Lawson) A. R. Prince. Abundant in an open, spring-fed marsh at the headwaters of Deer Branch, no. 5456 (G, P). Apparently infrequent in this area because of the lack of suitable habitats.

Asplenium pinnatifidum Nutt. Fairly common in crevices of granitic cliffs above road along Back Creek, about 2¼ miles south-southeast of Starkey P. O., no. 4053 (P). The only locality known in the region.

Pellaea glabella Mett. Numerous plants in crevices in vertical dolomite cliffs along Roanoke River, 1¼ miles south-southwest of Wabun, no. 149 (P, Roanoke College); abundant on exposed dolomite along Roanoke River at Dixie Caverns, no. 3649 (G). Rather rare this far south, but the more widespread *P. atropurpurea* is abundant on circumneutral rocks in this area.

Cheilanthes tomentosa Link. Shaly slope at the base of

Twelve O'clock Knob, 1.4 miles east by north of Wabun, no. 128 (P), station now destroyed by road-building; sandstone outcrops, Catawba Mountain, five miles north-northwest of Dixie Caverns, no. 2759 (P); exposed dolomite bluffs along Roanoke River at Dixie Caverns, no. 3671 (G, P).

Polypodium polypodioides (L.) Watt., var. Michauxianum Weath. (Contrib. Gray Herb. **124:** 31. 1939). Abundant on exposed calcareous outcrops on bluffs along Roanoke River, 1¼ miles south-southwest of Wabun, nos. 1040, 4096 (P), 5111 (G). Not observed on trees, its usual habitat farther south.

Equisetum prealtum Raf. Alluvial flats along Roanoke River, 1¼ miles south-southwest of Wabun, no. 5121 (P).

These plants with the sheaths unusually firm and flaring for *E. prealtum* are strongly suggestive of *E. laevigatum* A. Br. and might well be referred to that species, although intermediate between the two in many respects. Similar intermediates are reported from Botetourt and Norfolk Counties. Typical *E. prealtum* with tight, cylindric sheaths, soon fraying, is widespread in Roanoke County along streams and on rich, moist slopes. On the other hand, unmistakable *E. laevigatum* is known at but a single station in this part of the country, in Jefferson County, West Virginia.

Selaginella rupestris (L.) Spring. Abundant on sandstone outcrops, Catawba Mountain, nos. 3547 (G), 1964, 2761 (P).

Isoetes Engelmanni A. Br. Numerous plants growing permanently submerged in up to three feet of water in Spring Lake, Salem, no. 877 (P, Roanoke College); large plant in shallow water, marshy ground in deciduous woods, 1 mile north of Salem P. O., no. 5727 (P).

Tsuga caroliniana Engelm. Rocky ravine of Fort Lewis Mountain, northwest of Salem, no. 2517; slope of Poor Mountain south of Wabun, no. 3745 (P); moist slope along Bottom Creek, 3 miles southwest of Airpoint P. O., no. 3201 (G); steep, wooded slope along Back Creek, 2¼ miles south-southwest of Starkey P. O., no. 4020 (P); ravines and wooded hillsides at Hanging Rock, no. 1813 (P), altitude 1100 feet.

Here near its northern limit, *Tsuga caroliniana* is rather characteristic of the higher slopes of the mountains in the western part of Roanoke County, usually being found on rocky ridges, but frequently occurring along streams. In his discussion of the species in Virginia, R. S. Freer[1] reported the tree from Roanoke

[1] Claytonia 3: 7. 1936.

County and noted it in Bedford County at an altitude of 1,300 feet above sea level. Here it descends slightly lower, the last two stations cited being scarcely above 1000 feet.

THUJA OCCIDENTALIS L. Gnarled or, in favorable locations, slender trees on calcareous bluffs along the Roanoke River, nos. 893, 1021, 4095 (P).

SAGITTARIA AUSTRALIS (J. G. Sm.) Small. (*S. longirostra* of authors, not (Micheli) J. G. Sm.) Frequent in a spring-fed marsh along the west branch of Lick Creek, 1 mile west of Round Hill, no. 5515 (A, P).

Apparently an inland range-extension of a species occurring from Pennsylvania and Indiana southward, mostly on the Coastal Plain.

S. LATIFOLIA Willd., var. PUBESCENS (Muhl.) J. G. Sm. Abundant in an open marsh near the headwaters of Deer Branch, no. 5451 (A, G, P). Elsewhere in the county only typical *S. latifolia* has been found.

FESTUCA MYURUS L. Sandy roadside at the base of Fort Lewis Mountain, 3 miles northwest of Salem P. O., no. 2566 (P). Apparently not previously recorded from this part of Virginia.

POA CUSPIDATA Nutt. Wooded limestone bluffs along Roanoke River, nos. 1026, 1909 (P); wooded slope, 1½ miles west-northwest of Airpoint P. O., no. 1135 (P); low, rocky woods near Bennett Springs Station, no. 908 (P).

ERAGROSTIS PECTINACEA (Michx.) Nees. Disturbed ground, Mill Mountain, no. 5262 (P); old field, Fort Lewis Mountain, north-northwest of Dixie Caverns, no. 3894 (P).

MELICA NITENS (Scribn.) Nutt. Steep, wooded dolomite bluffs along Roanoke River, 1¼ miles south-southwest of Wabun, no. 3677 (P).

STIPA AVENACEA L. Scattered plants in dry woods, summit of Little Brushy Mountain, 2 miles west-northwest of Salem P. O., no. 2423 (P).

DANTHONIA SERICEA Nutt. Acid soil in pine-oak woods, Fort Lewis Mountain, 3¾ miles northwest of Salem P. O., nos. 1285 (P), 2549 (G); dry woods, 2 miles north-northwest of Salem P. O., no. 2496 (P); sterile soil, Green Ridge just north of Hanging Rock, no. 3034 (P).

Although characteristically a plant of the Coastal Plain, *D. sericea* is not uncommon in siliceous soils of the ridges across the northern part of Roanoke County where *D. spicata* abounds.

BOUTELOUA CURTIPENDULA (Michx.) Torr. Abundant in an old pasture and at the exposed summit of dolomite bluffs along Roanoke River at Dixie Caverns, no. 3658 (A, G, P).

Heretofore noted in Virginia by Allard on Short Mountain, Shenandoah County[1], and by Massey in Russell and Montgomery Counties.[2]

Digitaria filiformis (L.) Koeler. Sandy roadside north of Salem P. O., no. 5761 (G, P).

Paspalum ciliatifolium Michx., var. Muhlenbergii (Nash) Fern. Dry soil along a fire-road in a deep ravine of Fort Lewis Mountain, north-northwest of Dixie Caverns, no. 5567 (P); dry roadsides, 1¾ miles north by west of Salem P. O., no. 5049 (A, G, P).

P. laeve Michx. Moist meadow near the headwaters of Deer Branch, no. 5506 (P), 5485 (G); meadow just north of Roanoke College campus, Salem, no. 5036 (P); old field, 1 mile northwest of Salem P. O., no. 825 (P, Roanoke College).

Widely scattered throughout the county, this grass is rapidly becoming a pernicious weed on the Roanoke College Campus where it forms spreading mats impossible to cut with a mower.

P. laeve, var. pilosum Scribn. Scrubby woods, ¾ mile north of Salem P. O., no. 5008 (P).

P. dilatatum Poir. Several clumps in moist, disturbed ground at the base of a wooded limestone slope along Carvin Creek, 2 miles south-southwest of Hollins, no. 5531 (G, P).

Presumably not native here, but introduced from the Coastal Plain. *Lespedeza cuneata* G. Don, an Asiatic species widely planted and escaped in the eastern part of the state, and now appearing farther west, grows in an adjacent quarry, adding weight to this supposition.

Panicum stipitatum Nash. Abundant in shallow water in a small pond-hole at the base of Fort Lewis Mountain, 1.9 miles north by west of Salem P. O., no. 5093 (A, P).

P. meridionale Ashe. Dry, sandy woods, ¾ mile north of Salem P. O., no. 753 (P); exposed, sandy ground at the summit of Little Brushy Mountain, no. 2443 (A).

A species showing upland-coastal plain distribution, not noted by Fernald[3] in the Virginia mountains, but recently recorded from the Bull Run region in northern Virginia by Allard and Leonard.[4]

P. latifolium L. Moist, wooded slope along Bottom Creek,

[1] Claytonia 5: 15. 1938.

[2] Ibid., 5: 49. 1939.

[3] Rhodora 39: 478. Map 46. 1937.

[4] Castanea 8: 19. 1943.

3 miles southwest of Airpoint P. O., no. 3184 (A, P). Rare in this region.

Cyperus acuminatus Torr. & Hook. Moist depression with *Diospyros* on the E. A. Smyth, Jr. estate, about 1½ miles southwest of Salem P. O., no. 5017 (G, P).

Ranging widely in western U. S., but also having stations on the Atlantic Coastal Plain, *C. acuminatus* here occurs in the Blue Ridge, extending the range into the mountain area.

C. pseudovegetus Steud. Scattered plants in shallow, acid water of a small pond at the base of Fort Lewis Mountain, 1.9 miles north by west of Salem P. O., no. 5094 (G, P).

A range-extension inland in Virginia of a plant typical of the Coastal Plain from New Jersey southward to Florida and Texas and to Kansas and Indiana.

C. refractus Engelm. Muddy roadside, Mill Mountain, no. 5264 (P); moist ground in an old field just northwest of Dixie Caverns, no. 2578 (P).

Recorded by Fernald from Southampton County on the Coastal Plain as new to Virginia in Rhodora **43**: 536. 1941; here in the mountains.

C. ovularis (Michx.) Torr., var. sphaericus Boeckl. Moist depressions at Broad Street and Mount Vernon Place, Salem, nos. 819 (P, Roanoke College), 4072 (G).

Discussed by Fernald in Rhodora **43**: 537, 1941, and the range given as Arkansas to Oklahoma and Texas, Louisiana and Georgia, northward to southern Ohio, southern Indiana and Missouri with stations on the Virginia Coastal Plain. This station extends the range into the mountains of western Virginia. Elsewhere in the county the typical form occurs.

C. densicaespitosus Mattf. & Kükenthal (*Kyllinga pumila* Michx.). Abundant in disturbed, sandy ground near the Baptist Orphanage swimming pool, 1 mile north of Salem P. O., no. 5712 (G, P).

Eleocharis obtusa (Willd.) Schultes, var. jejuna Fern. With the typical form, along the moist margin of a small stream, about 1 mile north of Salem P. O., no. 5719a (P). Not heretofore noted in the Virginia mountains.

Rynchospora cymosa Ell. A few plants in shallow, acid water of a small pond at the base of Fort Lewis Mountain, 1.9 miles north by west of Salem P. O., no. 5088 (P).

Regarded as primarily a Coastal Plain plant ranging from New

Jersey and Pennsylvania to Florida and Texas and northward to Illinois and Indiana, the species here occurs west of the Blue Ridge with *Panicum stipitatum*, *Rynchospora glomerata* (L.) Vahl, var. *minor* Britton, *Carex lupulina*, *Lysimachia hybrida*, and the few scraps of *Sphagnum* known in Roanoke County.

SCLERIA TRIGLOMERATA Michx. Wet, sandy soil beside a small spring, wooded slope of Fort Lewis Mountain, 4 miles northwest of Salem P. O., no. 5641 (P). Rare here.

CAREX PENSYLVANICA Lam. Steep slope with calcareous outcrops along the Roanoke River at Dixie Caverns, no. 1101 (P). Not seen by Mackenzie from the state and first recorded by Fernald from southeastern Virginia[1]. Although this species usually grows in acid soils, the pH at this locality is about 7.5.

C. TONSA (Fern.) Bickn. Dry, brushy hillside, about ¾ mile north of Salem P. O., no. 1041 (P). Not seen by Mackenzie from Virginia, but noted by Fernald in Isle of Wight and Southampton counties[2]; this is apparently the first mountain station to be recorded.

CAREX HITCHCOCKIANA Dewey. Moist, wooded, east-facing limestone slope at Dixie Caverns, no. 5380 (G, P).

SPIRODELA POLYRHIZA (L.) Schleid. Abundant in a small pond-hole near Roanoke River, 2 miles southeast of Salem; abundant in a large spring at the head of Lick Creek, 1 mile west of Round Hill.

JUNCUS EFFUSUS L., var. PYLAEI (Laharpe) Fern. & Wieg. Muddy shore of Roanoke River, 0.8 mile south-southwest of Salem P. O., no. 1249 (P).

Rare this far south and not previously noted in this part of Virginia; J. EFFUSUS, var. SOLUTUS Fern. & Wieg. is the common form.

XEROPHYLLUM ASPHODELOIDES (L.) Nutt. Numerous plants in acid soil in low, scrubby woods, south-facing slope of Green Ridge, 2¼ miles northeast of Hanging Rock, no. 3442 (G); acid, rocky woods at Hanging Rock, no. 1835 (A, G, P); rocky, shaded ravine between Yellow and Buck Mountains, 5¼ miles south of Roanoke P. O., no. 5357 (P).

Abundant where found. Recorded from adjoining Bedford County by Freer.[3]

ZIGADENUS GLAUCUS Nutt. (*Z. chloranthus* of Gray, Manual, ed. 7, not Richardson; *Anticlea chlorantha* (Richards.) Rydb. of Britton & Brown and Small.) Scattered plants in shaly soil,

[1] RHODORA **40**: 399. 1938.
[2] RHODORA **40**: 399. 1938.
[3] Claytonia **4**: 15. 1937.

margin of second-growth oak woods, ridge of Poor Mountain, about 3¼ miles south of Wabun, no. 3824 (G, P), flowering, July 10, 1942; no. 5669 (A, P), fruiting, September 10, 1942.

The occurrence of isolated stations of this species or a closely related plant in the southern Appalachians is of some interest. In his discussion of *Zigadenus glaucus* and *Z. elegans* Pursh, Fernald[1] gave the habitat and range of the former as "calcareous gravel, cliffs, shores and bogs, chiefly of the St. Lawrence drainage, Mingan Islands and Anticosti, Quebec to Minnesota, south to northern New Brunswick, western New York, northern Ohio, northern Indiana and Illinois." He did not include stations south of this area, presumably because of the uncertain and fragmentary nature of the southern material. Small[2], however, noted *Anticlea chlorantha* in the Blue Ridge of North Carolina, apparently on the basis of two specimens in the herbarium of the New York Botanic Garden from Buncombe County, North Carolina: Elk Mountain, *Mrs. Anne R. Clement*, (a portion of a flowering stalk and three leaves) and "near Asheville", August 2, 1893, *B. L. Robinson*, (a full-size drawing of a plant, and a single flower mounted between squares of mica).

On July 6, 1942, Mr. Lloyd G. Carr told me of his finding *Z. glaucus* in some abundance on the limestone cliffs and ledges at Natural Tunnel in Scott County, Virginia. This was the first find of *Zigadenus* in the state. A few days later the small Roanoke County colony noted above was discovered on Poor Mountain at an altitude of about 3000 feet. These Virginia and North Carolina stations are apparently the only ones known in the southern Appalachians, although the plant is presumably more widespread in this area. The southern localities are seemingly quite isolated from the northern occurrences, although linking stations in West Virginia may possibly exist. Dr. Core writes me, however, that he knows of no records from West Virginia although he has looked for the plant there.

The North Carolina material, fragmentary though it be, seems to match the Virginia plants in all respects. However, the relationship of the southern and northern plants is not yet clear. The isolation of the southern stations is suggestive in

[1] Rhodora 37: 256–258. 1935.
[2] Manual of the Southeastern Flora. 274. 1933.

itself, and some differences between the two plants may exist, but I do not feel that the material at present is sufficient to justify any conclusions regarding the distinctness of the plant of the southern Appalachians from that of the St. Lawrence basin. The Virginia plants are tentatively placed, therefore, under *Zigadenus glaucus* Nutt.[1]

Melanthium virginicum L. Dryish, rocky woods near Big Bear Rock Gap, Fort Lewis Mountain, no. 5611 (P). Rather rare in the uplands.

M. parviflorum (Michx.) Wats. Scattered localities in the southern part of the county, nos. 3100, 3308 (P). Rather frequent in the mountains, but not often noted.

Allium cernuum Roth. Typical material occurs at many stations; variants: cool, rocky woods, summit of Fort Lewis Mountain, 3 miles north by west of Glenvar, no. 5621 (P), approaching *A. oxyphilum* Wherry; steep, wooded slope with limestone ledges along the Roanoke River, 1¼ miles south-southwest of Wabun, no. 4083 (A, G, P); rich wooded slope of Gravelly Ridge near the Roanoke-Botetourt County line, no. 5377 (P). At the last two localities, where the plant grows on calcareous rocks, the flowers are either pink or white. Elsewhere, only white-flowered plants have been seen. No. 5377 from Gravelly Ridge is unusual in its bright pink, short-pediceled flowers in a nearly erect umbel, suggesting the more western *A. stellatum*.

Lilium Michauxii Poir. (*L. carolinianum* Michx.). Acid soil, ridge of Poor Mountain, no. 3797 (P), 5679 (G); shaly slope Fort Lewis Mountain, northwest of Dixie Caverns, no. 3937 (P); cool, oak woods, 3 miles north by west of Glenvar, no. 5617 (P). Additions to the stations recorded by Fernald, Rhodora **41**: 471. Map 13. 1939.

Smilacina racemosa (L.) Desf., var. typica Fern. (Rhodora **40**: 407. 1938). Acid woods, Green Ridge, 2.7 miles northeast of Hanging Rock, no. 3460 (P).

S. racemosa, var. cylindrata Fern. (Rhodora **40**: 406. 1938). Widely distributed, many numbers, (G, P).

A few intermediates between this and var. *typica* occur, but in Roanoke County most specimens are easily referable to this more southern form with its shorter cylindric panicle, fewer flowers, and longer flowering peduncle.

Convallaria majuscula Greene. Common in the rocky soils of the mountain-tops. Many numbers (P).

[1] In this connection, Dr. Edgar T. Wherry advises me that he has studied a colony of a *Zigadenus* on Tennessee Bald Mountain, North Carolina, and considers it an undescribed species

TRILLIUM ERECTUM L., var. ALBUM (Michx.) Pursh. Small colony in alluvial soil along a small stream, Bent Mountain, May 17, 1940, *C. E. Wood, Jr.* (Roanoke College).

SMILAX GLAUCA Walt., var. GENUINA Blake. Acid, oak-pine woods near Bradshaw, 4 miles northwest of Dixie Caverns, no. 2679 (P).

S. GLAUCA, var. LEUROPHYLLA Blake. Several localities on Bent Mountain, Poor Mountain, Little Brushy Mountain, nos. 3261, 5684, 2448 (P).

DIOSCOREA OPPOSITA Thunb. (*D. Batatas* Dcne.). Escaped from cultivation in vacant lots along College Avenue, south of Main Street, Salem, no. 5043 (P).

D. QUATERNATA (Walt.) Gmel., var. GLAUCA (Muhl.) Fern. Abundant in almost every patch of woodland and on every moist slope where, with its leaves glaucous beneath and the lowermost whorled, it is a familiar sight throughout the county. Many numbers (P, G).

CLEISTES DIVARICATA (L.) Ames. A few plants in *moist*, siliceous soil in pine-oak woods of the south slope of Fort Lewis Mountain, 4 miles northwest of Salem P. O., no. 1276 (P).

Range-maps of this orchid published by Braun[1] and Fernald[2] show many stations on the Atlantic Coastal Plain and scattered stations in the mountains of North Carolina. No occurrences of the plant in the Virginia mountains were noted, but Wherry subsequently recorded a station in Craig County just to the north of Roanoke County[3]. The present locality adds a second station in western Virginia. I recall seeing in former years a single plant in a ravine about a mile distant from this locality. *Cleistes* is probably widely scattered in the *moist* (not wet), mediacids oils of the southern slope of Fort Lewis Mountain, although its occurrence from year to year is undoubtedly sporadic.

HEXALECTRIS SPICATA (Walt.) Barnhart. Several plants on a steep, semi-wooded dolomite bluff on Roanoke River at Dixie Caverns, no. 3648 (July 6, 1942, in bud) (A); no. 3648a (July 13, 1942, in flower) (P). Rare in the Virginia mountains.

SALIX LUCIDA Muhl. Shrub (15–20 feet) growing in sandy wash, rocky banks of Bottom Creek, Poor Mountain, about 2¼ miles northwest of Airpoint P. O., no. 3870 (P, Herb. C. R. Ball).

Dr. Ball has very kindly checked these and other willow specimens and writes me (Oct. 16, 1942) that he knows of no other

[1] RHODORA 39: 197. Map 10. 1937.
[2] Ibid., 39: 327. Map 2. 1937.
[3] Claytonia 4: 54. 1938.

station for this willow south of the Pennsylvania-Maryland line. *S. lucida* is presumably native at this locality, however. The station is at an altitude of over 3000 feet where conditions are suitable for northern plants, and, indeed, many of the accompanying plants are of high altitude or northern types, e. g. *Betula lutea, Viola rotundifolia, V. pallens, Trientalis borealis,* and *Viburnum alnifolium.*

Salix purpurea L. Scattered, shrubby trees, introduced and spreading in marshy ground along the west branch of Lick Creek, 1 mile west of Round Hill, no. 5525 (G, P).

Quercus bicolor Willd. A single tree (about 40 feet high) at the edge of an open, spring-fed marsh at the headwaters of Deer Branch near the old Hollins School, no. 5503 (A, G, P). This occurrence is in the central valley in an area underlain by limestones. I have not found the species elsewhere in the county.

Q. Muhlenbergii Engelm. Moist, wooded slope at Dixie Caverns, no. 3390 (P); abundant on dolomite bluffs along Roanoke River at Dixie Caverns, nos. 3702, 3701, 3697 (P), 3696 (A), 3695 (G). Very abundant on limestone slopes, and here showing considerable diversity in foliage.

Celtis occidentalis L., var. crassifolia (Lam.) Gray. Moist woods, summit of Catawba Mountain, ¾ mile west-northwest of Catawba Sanitarium Station, no. 3513 (P).

C. pumila (Muhl.) Pursh. Low shrubs, 3–4 feet high, in an old pasture with dolomite outcrops, steep slope along the Roanoke River at Dixie Caverns, no. 3654 (G, P); a small tree about 15 feet high with scarcely toothed leaves and spherical, orange fruits on a wooded limestone slope along Carvin Creek, about 2 miles south-southwest of Hollins, no. 5526 (G, P).

Ulmus alata Michx. A medium-sized tree, suckering from the roots, on an open hilltop near the ruins of an old house, 0.8 miles north of Salem P. O., no. 1065 (P).

This may represent an introduction, for near the colony a cultivated species of *Opuntia* is well established and is spreading. However, *Ulmus alata* is itself well established at this locality and is spreading vegetatively at present; no fruit has been noted.

Broussonetia papyrifera (L.) Vent. Vacant lots, roadsides: Salem, nos. 5040, 5041 (A, P). Well established and apparently spreading. Only staminate trees have been noticed, however. A very large and old staminate tree has stood on the Roanoke College campus for many years.

Morus alba L., var. tatarica (L.) Loud. Vacant lots, roadsides in and near Salem, no. 5784 (P). This is the common red-fruited tree. At one time a few trees of the typical, white-

fruited form were established in an orchard in Salem, but these have been destroyed.

PHORADENDRON FLAVESCENS (Pursh) Nutt. On *Quercus rubra*, Hollins College, November 20, 1936, *P. M. Patterson* (Hollins College); seen on *Acer saccharinum* on the Hollins College campus, December 1942; a small specimen in the top of a young tree of *Diospyros virginiana* in a moist depression near the home of Miss Grace Smyth, who pointed out the plant, 1.6 miles southwest of Salem P. O.

BUCKLEYA DISTICHOPYLLA (Nutt.) Torr. A large colony extending for several hundred yards along a stream beneath *Tsuga canadensis* on each side of the Roanoke-Craig County line on Highway 311 in the ravine between Cove and North Mountains, *Freeman*, U. S. National Herb. no. 81044; *C. E. Wood, Jr.* no. 5440 (A, G, P).

Discovered by O. M. Freeman and reported by him in *Castanea* **6:** 76. 1941. I found the plants in abundant fruit in early September 1942. The spot is sometimes used as a picnic area, but it is unlikely that the colony will be destroyed unless felling of the hemlocks in the ravine is attempted.

PYRULARIA PUBERA Michx. Moist, rocky woods, Green Ridge at Hanging Rock, no. 796 (P); damp, wooded ravine of Fort Lewis Mountain, 2.7 miles northwest of Salem P. O., no. 829 (P); moist, wooded slope, 3 miles southwest of Airpoint P. O., no. 3198 (P); moist, wooded slope along Back Creek, 2¼ miles south-southeast of Starkey P. O., no. 4037 (A); rich slope along Back Creek, 1.9 miles south-southwest of Cave Spring, no. 3320 (G, P). Widely distributed and not uncommon where found.

POLYGONUM TENUE Michx. Abundant on an open, shaly slope of Fort Lewis Mountain, 2.9 miles north-northwest of Dixie Caverns, with *Clematis albicoma*, var. *coactilis*, no. 3931 (P), 5592 (G).

P. COCCINEUM Muhl. Common in shallow water of a spring-fed marsh at the headwaters of Deer Branch, no. 5510 (P). Rare this far south.

P. SETACEUM Baldw., var. INTERJECTUM Fern. Low, moist depressions along Mason Creek at Hanging Rock, no. 782 (P, Roanoke College).

P. ORIENTALE L. Scattered plants in weedy ground at the top of the old inclined railway on Mill Mountain, Roanoke, no. 5278 (P). Rare in this region.

AMARANTHUS SPINOSUS L. Weedy lots, Salem, no. 5777 (P); barnyard, 1.6 miles southwest of Salem, no. 5027 (P). A well established and obnoxious weed.

A. GRAECIZANS L. Scattered plants along the Norfolk and

Western Railroad tracks at Randolph Street, Roanoke, nos. 3706 (P), 3703 (G).

OXYBAPHUS NYCTAGINEUS (Michx.) Sweet. Scattered plants with *Amaranthus graecizans*, no. 3704 (P).

STELLARIA LONGIFOLIA Muhl. Moist meadow on Bottom Creek, Bent Mountain, 3 miles southwest of Airpoint P. O., no. 3275 (P).

S. AQUATICA (L.) Scop. With *S. longifolia*, no. 3265 (P).

SILENE CUCUBALUS Wibel. (*S. latifolia* (Mill.) Britten & Rendle.) Roadsides, 4.8 miles southwest of Airpoint P. O., no. 3229 (P).

Fernald recorded the species from York and Henrico Counties in eastern Virginia, extending the range south from Maryland and the District of Columbia.[1] This is the southernmost station in the mountains thus far noted.

LYCHNIS ALBA Mill. Disturbed roadsides, Bent Mountain, nos. 3141, 1137, 3230 (P); along fire-road, Fort Lewis Mountain, 2.9 miles north-northwest of Dixie Caverns, no. 3893 (P).

Well established, particularly on the plateau of Bent Mountain where with *Silene dichotoma* Ehrh. it imparts a characteristic appearance to the roadsides. Deam (*Flora of Indiana*) gives the range of this plant as Nova Scotia to Michigan, southward to New York and Pennsylvania.

CALTHA PALUSTRIS L. Swampy alder thickets, 1 mile northwest of Airpoint P. O., no. 1105 (P); wet thickets along a small stream, 4¼ miles west of Catawba Sanitarium Station, no. 1976 (P).

CLEMATIS ADDISONII Britton. Dryish, shaly soil over limestone, steep, wooded dolomite bluffs along Roanoke River, 1¼ miles south-southwest of Wabun, no. 148 (G, P).

Clematis Addisonii was described from specimens collected along the Roanoke River south of Roanoke by Britton and others of the Torrey Club who visited the region in the spring of 1890.[2] In succeeding years J. K. Small and others visited the locality and many specimens of the plant were collected and placed in most of the major herbaria. When Britton's group first visited Roanoke, the *Clematis* was abundant along the river south of the town, but Small and Vail collecting there two years later wrote: "The locality discovered in 1890 was again visited and found to have been nearly obliterated by the quarrying down of the hill

[1] RHODORA 43: 551. 1941.

[2] See Mem. Torr. Bot. Cl. 2: 28. 1890.

in the process of building new streets, so that where hundreds of plants were seen before, not more than a couple of dozen were noticed."[1] Since then *C. Addisonii* has apparently not been collected in the county and this locality has now been completely covered by the city of Roanoke. However, the plant occurs along the dolomite cliffs and bluffs farther west and in a few other counties in this region (Montgomery, Bedford, Botetourt, and Rockbridge).

C. ALBICOMA Wherry, var. COACTILIS Fern. This endemic plant of shaly slopes was figured and fully described from Roanoke County specimens by Professor Fernald in RHODORA **45:** 407, Plate 780, 1943.

CALYCANTHUS FERTILIS Walt. Abundant on moist, wooded limestone slopes just northwest of Dixie Caverns, no. 3584 (G, P).

Shrubs, 6–8 feet tall, with glabrous, glaucous leaves. The crushed flowers are strawberry-scented, manuals to the contrary.

BERBERIS THUNBERGII DC. Numerous seedlings becoming established along Highway 311 north of Hanging Rock, no. 1836 (P).

THLASPI PERFOLIATUM L. Scattered plants along roadside, 2 miles southeast of Salem P. O., flowering and fruiting, April 5, 1942, no. 1901 (P). Rare in Virginia.

CAMELINA MICROCARPA Andrz. Roadside at Bradshaw, 4 miles northwest of Dixie Caverns, no. 2693 (P).

DRABA VERNA L. Abundant in a hillside pasture at Dixie Caverns, no. 1007 (P); lawn weed, Salem, no. 1947 (P). Seldom collected or noted.

ERYSIMUM CHEIRANTHOIDES L. Wooded slope of Little Brushy Mountain, no. 2462 (P).

TIARELLA WHERRYI Lakela. See Fernald, RHODORA **45:** 445. 1943. Abundant on a moist, wooded hillside above Back Creek, about 2¼ miles south-southeast of Starkey P. O., no. 4028 (A, G, P).

POTENTILLA RECTA L. Abundant along the Virginian Railroad at Salem, no. 1230 (P); roadsides at Dixie Caverns, no. 3664 (P).

RUBUS PHOENICOLASIUS Maxim. Along road at the base of jutting granitic cliffs on a moist, wooded slope along Back Creek, 2¼ miles south-southeast of Starkey P. O., no. 4013 (G, P).

First reported from Virginia by Fernald[2] who found the plant along Three Creek, Drewryville, Southampton County. This

[1] Ibid., **4:** 96. 1893.

[2] RHODORA **40:** 434. 1938.

Asiatic species is just becoming established in Roanoke County and seems to be otherwise unknown in the Virginia mountains.

R. Enslenii Tratt. Shaly roadbank in sterile, acid woods on the south slope of Green Ridge, 2¼ miles northeast of Hanging Rock, no. 3453 (P); sterile oak-pine woods along Fire-Road 4058, 4 miles northwest of Dixie Caverns, no. 2605 (P).

R. alleghenensis Porter, var. calycosus Fern. (Rhodora **10:** 51. 1908). Roadside, along Bottom Creek, Poor Mountain, 2¼ miles northwest of Airpoint P. O., no. 3856 (A, P).

Prunus pensylvanica L. f. Small tree among low scrub at the open summit of Poor Mountain, altitude 3960 feet, no. 5691* (P). Found here only at the highest altitudes.

Coronilla varia L. A well-established colony along a dirt road, 0.8 miles northeast of Salem P. O., no. 5037 (A, G, P).

Previously reported in Virginia from Russel County by A. B. Massey in *Claytonia* **5:** 50. 1939.

(*To be continued*)

A Further Item on Lilium michiganense.—*Lilium michiganense* Farwell has been so supported and so condemned by various recent authors that I hesitate, without intimate field-knowledge of it, to take sides. However, much of the discussion of it in relation to *L. canadense* L. and *L. superbum* L. has been by botanists with at least only a minimum of field-acquaintance with one or both of those species. I may, therefore, be pardoned if I call attention to some points which have not been emphasized. In Deam's Flora of Indiana very valuable notes are given and a real help comes from his item on umbellate and non-umbellate inflorescences. Of course, when the flowers are solitary this character is useless but when there are several flowers it is very real. Taking all the material in the Gray Herbarium and the Herbarium of the New England Botanical Club with 3 or more flowers, I get the following score. L. canadense, 1 or more umbels or near-umbels, 49 nos.; flowers scattered, not subumbellate, 2. L. michiganense, 1 or more umbels or near-umbels, 40; flowers scattered, not subumbellate, 0. L. superbum, 1 or more umbels or near-umbels, 26; flowers scattered, not subumbellate, 44. In other words, the tendency to an umbellate inflorescence is stronger in *L. canadense* and *L. michiganense* than in *L. superbum*.

In RHODORA, xliv. 455 (1942) Dr. Wherry (in his key) noted *Lilium canadense* and *L. michiganense* as having "anthesis early aestival", while in *L. superbum* it is "late-aestival". Here is a real point which may well be amplified. Taking, again, all flowering material in the two large herbaria at hand and recording the date of collection of all with expanded flowers I get the following score: L. CANADENSE (166 specimens) flowering from mid-June (11th) to early August, with average date July 6; L. MICHIGANENSE (43 sheets) flowering from late June (25th) through July, with average date July 6 (the same as *L. canadense*); L. SUPERBUM (63 specimens) flowering from mid-July (16th) to early September, with average date August 1. If, as some maintain, the exclusively inland and rather northern *L. michiganense* is identical with the chiefly coastwise and decidedly southern *L. superbum*, is it not remarkable that their periods of anthesis should be so different?

Many morphological characters more or less separating the two latter have repeatedly been pointed out. To these I should add the deeply 3-lobed stigma of *L. superbum* as opposed to the more broadly and shallowly lobed stigma of *L. michiganense* and I can not overlook the fact that the usually longer anthers of the former species are essentially linear, those of the latter species shorter and more oblong. I am, at least from herbarium-material, unable to unite these species.—M. L. FERNALD.

CIRSIUM FLODMANI IN NEW ENGLAND.—In RHODORA, **45** (1943), 356, Professor Fernald reported that the prairie and plain species *Cirsium Flodmani* (Rydb.) Arthur, supposed to reach its eastern limits in Manitoba, Minnesota, and Iowa, is also known from the Temagami Forest Reserve in Ontario and from Essex County, N. Y., and queried whether these were native stations or the results of recent eastward migration.

This species is a segregate from *C. undulatum* (Nutt.) Spreng., under which name a thistle is reported in E. J. Dole's *Flora of Vermont* (1937), 264, from Wells River, Vt. Mr. C. A. Weatherby has kindly called my attention to this citation, and also to the fact that a specimen in the New England Botanical Club Herbarium, collected by me in a dry pasture south of Island Pond,

Brighton, Essex Co., Vt., on 6 Aug., 1940, clearly belongs to *C. Flodmani.* Whether the plant is here native or introduced may still be queried, but at any rate it is now a species to be considered in any enumeration of the plants of New England.—Arthur Stanley Pease, Harvard University.

Spergula pentandra in America.—*Spergula arvensis* in its varying forms is so common and has so often encouraged amateurs to hope that they had something novel, besides typical *S. arvensis* L. and its var. *sativa* (Boenn.) Reichenb., that weed-hunters may welcome the fact that another real species has arrived from Europe. On April 8, 1942, the keen student of the Cape May flora, O. H. Brown, collected a weed in Cold Spring Cemetery at Cold Spring, Cape May, New Jersey, which, referred to me through Mr. Long, proves to be the European *S. pentandra* L., which is sufficiently different from *S. arvensis* to satisfy any one. In the former the leaves are channeled at base, the plump seeds with a very narrow wing. *S. pentandra* is a smaller plant, the filiform leaves scarcely channeled, and its smooth flat seeds have a wing as broad as the body. It should be watched for; the cemetery at Cold Spring is probably not its only American station.—M. L. Fernald.

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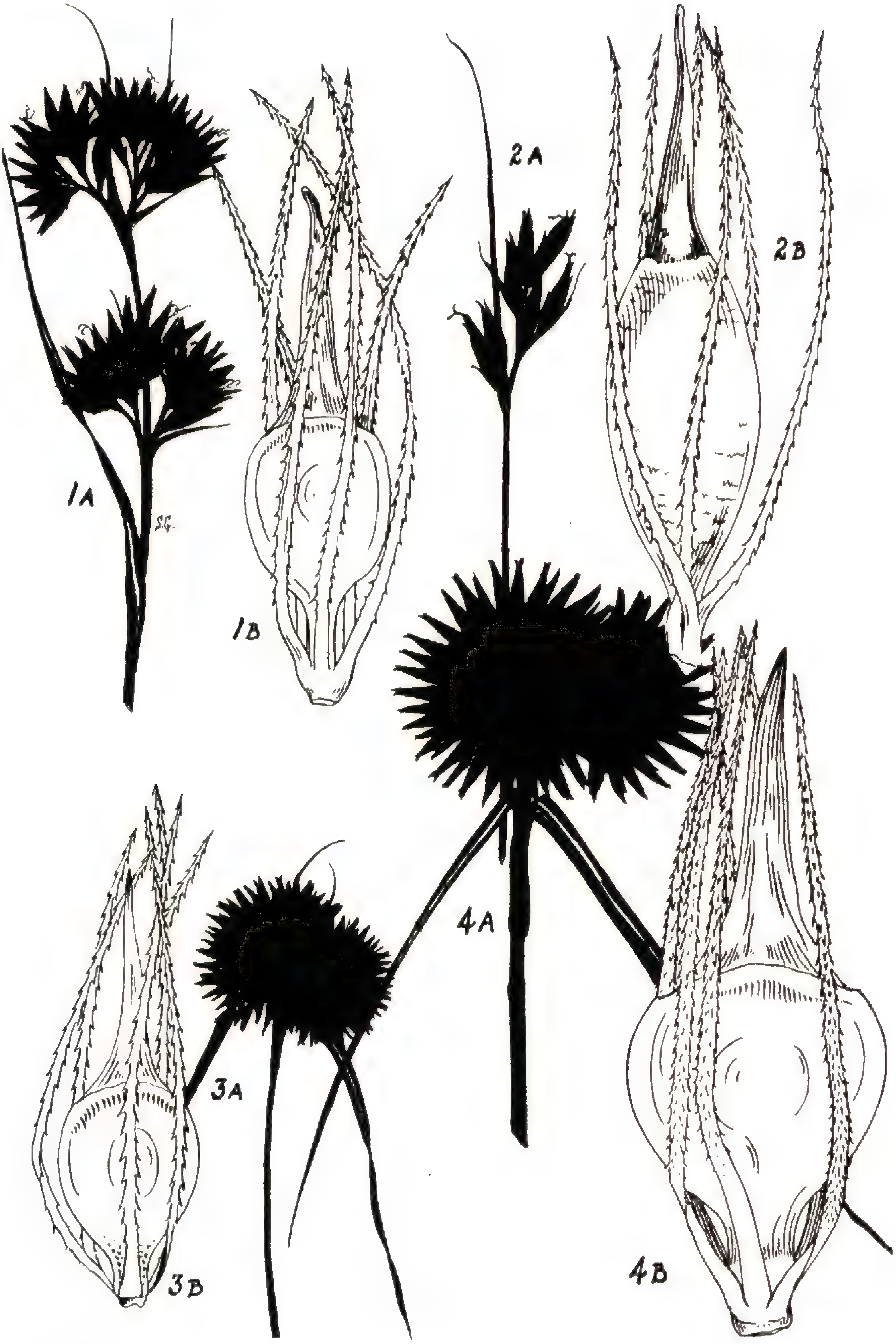

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RHYNCHOSPORA CHALAROCEPHALA: FIG. 1A, portion of inflorescence, × 2; FIG. 1B, achene, × 20.
R. CAPILLACEA: FIG. 2A, portion of inflorescence, × 2; FIG. 2B, achene, × 20.
R. MICROCEPHALA: FIG. 3A, portion of inflorescence, × 2; FIG. 3B, achene, × 20.
R. CEPHALANTHA var. TYPICA: FIG. 4A, portion of inflorescence, × 2; FIG. 4B, achene, × 20.

Rhodora

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RHYNCHOSPORA, SECTION EURHYNCHOSPORA, IN CANADA, THE UNITED STATES AND THE WEST INDIES

Shirley Gale[1]

(Plates 818–835)

In 1806 Vahl[2] segregated the genus *Rhynchospora* from *Schoenus* as the latter had been defined in the inclusive sense of Linnaeus. Vahl's brief diagnosis, with its emphasis upon the indurated, persistent style, was followed by descriptions of nineteen species. Of these original species nine are now recognized members of the Section *Eurhynchospora*. *R. inexpansa*, *R. fascicularis*, *R. distans* (*R. fascicularis* var. *distans* (Michx.) Chapm.), *R. capitellata*, *R. sparsa* (*R. miliacea* (Lam.) Gray) and *R. ciliata* (*R. ciliaris* (Michx.) Mohr) had been previously described under *Schoenus* by Michaux;[3] *R. glomerata* and *R. alba* under *Schoenus* by Linnaeus;[4] and *R. glauca* was only a new name given by Vahl to his own previously described *Schoenus rugosus*.[5] *R. fusca* (L.) Ait. f. was also included by Vahl as *R. alba* β *fusca*. Of these species *R. alba* has been selected to typify the genus.[6]

[1] Now Mrs. Chester E. Cross.
[2] Enum. ii. 229 (1806).
[3] Fl. Bor.-Am. i. 35–37 (1803).
[4] Sp. Pl. 44 (1753).
[5] Vahl, Eclog. Am. ii. 5 (1798).
[6] M. L. Green, Standard-Species Nom. Conserv. no. 492 (1926), mimeographed.

In 1816 Elliott published the first pages of his Sketch of the Botany of South Carolina and Georgia. Here he described three new species of *Rhynchospora*, *R. plumosa*, *R. punctata*, *R. caduca*, and, under *Scirpus*, a fourth, *R. schoenoides* (Ell.) Wood. He also made the new combination, *R. rariflora*, from Michaux's *Schoenus rariflorus*.

Unfortunately nothing but confusion has resulted from Muhlenberg's treatment of the genus. He attempted to reinstate *Schoenus* as inclusive of *Cladium* and *Rhynchospora*. Although several new species were listed in the first edition of his Catalogue[1] in 1813, they were not validated until the publication of his Descriptio Uberior Graminum[2] four years later. The names of his new species *S. ciliaris*, *S. capitatus*, *S. cymosus* and *S. setaceus* were later homonyms under *Schoenus*, nor are they available for use under *Rhynchospora*. Finally, he frequently neglected to give any indication of the authorship of his species.

Asa Gray's[3] early monograph of North American *Rhynchospora* is the first treatment of the genus to be done in the carefully documented, modern style; and it forms the basis for all later work on the genus as it is represented in Canada and the United States. Gray was able to verify, by means of fragments from the Michaux Herbarium, all of the Michaux species. He had the use of John Torrey's herbarium which contained among others, specimens collected by Elliott, Schweinitz, Ingalls and Curtis, as well as the herbarium of Baldwin. At the Philadelphia Academy of Natural Sciences he saw the Schweinitz herbarium and the Muhlenberg herbarium. Of the latter he remarks, "Specimens of many of these [Muhlenberg's species], however, do not exist in his herbarium; and those which have a place are in such a state of confusion, (there being often three or four species with a single label) that little information is to be obtained by consulting it." Gray wisely chose to base his treatment on the details of the achene; and, to aid in correct identification, a plate figuring the achene of each species was prepared. The descriptions are original, detailed, and accurate, and are accompanied by synonymy, the citation of specimens and careful dis-

[1] Ibid. 5 (1813).
[2] Ibid. 4 (1817).
[3] Ann. Lyc. N. Y. iii. 191–220 (1835).

cussions. The exigencies of the primary division into "nuts rugose" and "nuts not rugose" forced the separation of *R. plumosa* from the closely related *R. oligantha;* but, in good part, the related species were placed together. There was, however, no attempt to separate the thirty recognized species into formal groups.[1] *R. Torreyana, R. microcarpa* Baldw. ex Gray, *R. Elliottii* (renamed *R. Grayii* by Kunth), *R. megalocarpa, R. Baldwinii, R. oligantha, R. gracilenta,* and *R. cephalantha* were the additions to the Section *Eurhynchospora.* The correct combination *R. miliacea* was made from Lamarck's *Schoenus miliaceus,* and given preference over *R. sparsa* (Michx.) Vahl. However, to *Scirpus schoenoides* of Elliott, Gray gave a new name, *R. multiflora,* rather than the correct combination which was later made by Wood.[2] *R. patula* Gray was a *nomen confusum* since it was applied to sheets of *R. microcarpa* and *R. caduca. R. dodecandra* Baldw. ex Gray and *R. pycnocarpa* were synonyms of *R. megalocarpa,* as was *R. semiplumosa* of *R. plumosa* Ell. *R. paniculata* is true *R. glomerata* (L.) Vahl and the species to which the latter name was applied by Gray is *R. capitellata* (Michx.) Vahl.

A year later in Torrey's North American Cyperaceae[3] Gray reworked his treatment of *Rhynchospora,* segregating *R. oligantha, R. plumosa* and its synonym, *R. semiplumosa,* as 1, "*Eriochaete*" separated by the subglobose achene and plumose bristles; and 2, "*True Rhynchosporae*", including species with lenticular or compressed achenes. *R. macrostachya* and *R. corniculata* were transferred to the genus *Ceratoschoenus.* One new species, *R. filifolia* Gray, was described, and *R. pycnocarpa* was reduced to synonymy under *R. megalocarpa.*

In the year previous, Nees von Esenbeck[4] published his Synopsis Generum Cyperacearum. This was a much needed attempt to give the diagnostic characters of the *Cyperaceae,* and, in some cases, of the principal subgeneric divisions. He limited the genus *Rhynchospora* to species with "spiculae polygamae. Stylus bifidus. Perigynium setosum, setis rigidis denticulatis.

[1] With the exception of a suggestion that *R. corniculata* and *R. macrostachya* might be referred to *Cephaloschoenus* Nees.

[2] Class-Book of Bot. 744 (1861).

[3] Ann. Lyc. N. Y. iii. 362–372 (1836).

[4] Linnaea ix. 282 (1835).

Caryopsis styli basi persistente discretaque latirostrata." Although this definition is practically identical with that now applied to the Section *Eurhynchospora,* it was followed by a list of species many of which belonged to other sections.

Kunth's Enumeratio, Volume ii, appeared in 1837. The forty-four species of *Rhynchospora* were divided into the *Capitatae, Longirostres* and *Communes.* Of these only the *Communes* are considered in this paper; but it is important to notice that, as in *Rhynchospora* sensu Nees, the group *Communes* had the "Stylus bifidus" and was, in part, a precursor of the Subgenus *Diplostylis.* Kunth's treatment of the species consisted of a careful review rather than the addition of new species. His descriptions, like those of Gray, drew particular attention to the achenes. His special contribution is his elaborate synonymy, to which I am indebted for the clue to the identity of *Schoenus cymosus* Willd. In the Addenda and Corrigenda, he gave to *R. Elliottii* Gray its present name, *R. Grayii,* on account of the earlier *R. Elliottii* of Dietrich.

The treatment in Steudel's *Cyperaceae,*[1] despite its inclusion of several new species, was less original than that of Kunth. Steudel's main divisions were geographical. Under "I. Species Americae septentrionalis" he placed Gray's *Eriochaete* and *Rhynchosporae verae* (latinizing the latter). Under "II. Species Americae australis" he had a vague key, emphasizing, in the primary divisions, plumose as contrasted with scabrous bristles; and, in the secondary divisions, the type of inflorescence. Many of Steudel's descriptions were condensed latinizations of Gray's descriptions, both from the Monograph and from the North American Cyperaceae. He even included a full description of *R. pycnocarpa* Gray, although he explained in a note that it had been reduced by its author to a synonym of *R. megalocarpa.* Of Steudel's new species, *R. longiseta, R. microseta* and *R. foliata* are unknown to me. *R. longiseta* and *R. microseta* are referred by the Index Kewensis to the synonymy of *R. caduca* Elliott and *R. ciliata* Vahl (*R. ciliaris* (Michx.) Mohr) respectively. *R.* ? *monostachya* Steud. is *Eleocharis tuberculosa*[2] and *R. etuberculata* is referred again by the Index Kewensis to *Scirpus leptolepis.*

[1] Ibid. 139 (1855).
[2] See Svenson, Rhodora xxxix. 248 (1937).

Steudel also gave to *R. pallida* Curtis another name, *R. Curtisii*, thinking that *R. pallida* Nees, which had not previously been validly published, took precedence.

Grisebach[1] in 1857 set up the Section *Eurhynchospora* to contain species with "Setae elongatae. Stylus bifidus", and he typified it by *R. glauca* Vahl (*R. rugosa* (Vahl) Gale). This definition was later amplified in Part vi. of the Flora of the British West Indies[2] with the additional character "achaenium separated from the beak by a broad transverse joint." Of the species listed by him, I am excluding *R. cephalotes* Vahl from the section on the basis of its indurated scales and coarse, peculiar habit. *R. gracilis* Vahl is of uncertain identity, but Grisebach was probably using it in the sense of *R. globularis* (Chapm.) Small, var. *recognita* Gale and *R. rugosa* (formerly *R. glauca* Vahl).

Grisebach's chief contribution to the knowledge of this genus came with his work on the Wright collections from Cuba. *R. pruinosa* was described in Part II. of the Plantae Wrightianae[3], but the bulk of the new species were published in the Catalogus Plantarum Cubensium.[4] Here were added to the Series *Cernuae*, previously represented only by *R. pruinosa*, 4 additional species *R. Lindeniana*, *R. scabrata*, *R. tenuifolia* and *R. cernua*, although Grisebach mistakenly placed the last named species in a new section, *Microchaeta*. *R. odorata* Wright ex Griseb. was also included. *R. penniseta*, however, is *R. plumosa* Gray; *R. deflexa* is *R. cubensis* Rich., and *R. setacea* sensu Grisebach, non Vahl, is *R. rariflora* (Michx.) Ell. *R. cephalotoides*, also included by Grisebach in the Section *Eurhynchospora*, is closely related to *R. cephalotes*. I have excluded both of these species from this section. Known from the mainland, but new to Cuba, was *R. miliacea*.

The work begun by Grisebach was continued by Wright, working in collaboration with Francesco Sauvalle. The portion of the Flora Cubana[5] dealing with species of *Eurhynchospora* was published for the first time in 1871. Wright's new species *R.*

[1] Goetting. Abh. vii. 272 (p. 124 of repr.) (1857).
[2] Ibid. 573 (1864).
[3] Ibid. 535 (1862).
[4] Ibid. 242 (1866).
[5] Anal. Acad. Ci. Habana, viii. 83 (1871).

leptorhyncha and *R. brachychaeta* were carefully described; others, already treated by Grisebach or earlier authors, were merely listed with the number of the Wright collection. The authentic specimens are at the Gray Herbarium, as are also duplicates of Grisebach's species, but special care has been necessary in their citation, for the sheets are badly scrambled; the same number has often been applied to specimens belonging to 2 or more species and the accompanying memoranda as to locality and habitat often cannot be oriented with certainty to one of possibly three specimens on a sheet.

In 1873 Otto Boeckeler published, under the title Die Cyperaceen des Königlichen Herbarium zu Berlin, a treatment of the Tribe *Rhynchosporeae.* He described in all 136 species of *Rhynchospora,* several of which he derived from *Dichromena* as transfers. These were divided into two groups: A. *Capitatae,* B. *Corymbosae.* The *Eurhynchosporae* appeared with species of other sections under the latter heading. In this treatment most of the new species were Brazilian, but Boeckeler's descriptions of such North American species as *R. alba, R. caduca, R. plumosa,* etc. were original and among the best that have been written.

The designation *Dichostyleae* appeared in the summary of the genus by Bentham and Hooker.[1] It set off from the *Haplostyleae,* with apically bilobed styles, those species in which the styles were deeply cleft, forming slender stigmatic branches equal in length to the undivided portion of the style.

Prior to 1892 Gray's original treatment of species of the Coastal Plain had been augmented by scattered publications of other authors, notably Curtis, Carey, Boott, and more especially by Chapman's Flora of the Southern States. In that year, however, Britton[2] published a list of North American *Rhynchospora.* This list covered the Mexican species, but excluded those from the West Indies. It gave little information outside of the few characters employed in a rudimentary key to the groups of species. Its principal emphasis was placed on the synonymy, which was frequently incorrect, and statements as to the range of the species. Britton had been supplied by Clarke with an abstract of the latter's arrangement of the North American

[1] Gen. Pl. iii. 1060 (1883).

[2] Trans. N. Y. Acad. Sci. xi. 83–93–repr. 10–19 (1892).

species, and the *Eurhynchosporae,* as well as some species of other sections, were placed under the "Subgenus *Eurhynchospora* Clarke." *R. alba* var. *macra* Clarke, *R. glomerata* var. *discutiens* Clarke, and *R. fuscoides* Clarke were new; and were apparently taken from the abstract referred to in the introductory note. *R. fuscoides* was here without description but was validly published two years later in Clarke's treatment of the *Cyperaceae* for Urban. *R. glomerata* var. *minor* (*R. capitellata* (Michx.) Vahl) and *R. axillaris* var. *microcephala* (*R. microcephala* Britt. ex Small) were additions by Britton himself. *R. compressa* Chapm. was reduced to a variety under *R. cymosa* (*R. globularis* var. *recognita* Gale).

C. B. Clarke wrote the treatment of the *Cyperaceae* for Urban's Symbolae Antillanae, Volume II. With the fifty-five species of *Rhynchospora* appears the first key to species. Presumably it is, in part, a natural key, since series and sections are directly assigned to its main divisions. Its chief faults are those of brevity and too great a reliance on measurements. There is no mention of a subgenus, or even of a section *Eurhynchospora.*

Species of that section, as it is here interpreted, occur under the heading of Series B. *Diplostyleae,* and are classified as Section 2, *Plumosae,* Section 3, *Albae,* Section 4, *Fuscae,* and Section 5, *Glaucae.* Section *Plumosae* includes, in addition to *R. plumosa* Gray, the totally different *R. lunata* which has a curious horned tubercle. Section *Albae,* as defined, is synonymous with Series *Glomeratae* Small. It is represented only by *R. alba* from the mountains of Puerto Rico. Section *Fuscae* includes *R. fuscoides* (which is here supplied with a description), *R. leptorhyncha, R. fascicularis, R. distans* sensu Clarke (also *R. fascicularis*), *R. gracilenta* sensu Clarke (*R. leptorhyncha*), *R. Lindeniana,* and *R. pallida* sensu Clarke (*R. brachychaeta*). This section is defined as having setae antrorsely scabrous, nut smooth, not transversely wrinkled. Clarke must have overlooked the slightly rugulose surface in *R. Lindeniana. R. brachychaeta* (wrongly identified by Clarke as *R. pallida*) I have put with true *R. pallida* in the Series *Chapmaniae.* Section *Glaucae* is merely a name for a jumble of species having achenes with rugulose surfaces. Clarke placed a strong, and I think mistaken, emphasis on the importance of the original spelling of *Rhynchospora* as "*Rynchospora.*"

As a result of this he took up the first specific name to appear in combination with the original "*Rynchospora*." If a specific name had always appeared with the spelling, "*Rhynchospora*," he made a new combination under the old spelling. This explains his recognition of *R. sparsa* Vahl in preference to the earlier combination *R. miliacea* (Lam.) Gray. It also explains why Vahl, Britton and Clarke are the only authorities cited after names of species long in good standing.

After the turn of the century, important treatments were included in the following: Small's Flora, 1903; the revision of Gray's Manual by Robinson & Fernald, 1908; and, later, Small's Manual, 1933. Britton also published *Rhynchospora* of Cuba,[1] another list which included new species and their descriptions.

Specific Criteria.—The species of *Rhynchospora* which come within the scope of this paper are perennials. The roots are of little aid in classification. They are usually fibrous and richly branched or occasionally thickened and spongy with only a few short branchlets. The bases are more often distinctive. In *R. pallida* they are usually cormous and covered with short, broad, imbricated scales—a condition occurring to a lesser degree in *R. megalocarpa*. In the Series *Cernuae* a short, densely fibrous caudex is developed, the fibres resulting from the fraying-out of the fibro-vascular strands in the lower portions of the old dried basal leaves. This character is one of several which are probably correlated with the intermittently exsiccated habitats of these species. The bases of *R. cubensis* and *R. stenophylloidea* are subligneous. A few species have stolons. Those of *R. fusca* are slender, whereas short, thick stolons bud out from the bases of *R. pallida*. *R. megalocarpa*, which populates the sand-hills of the southern Coastal Plain, also spreads by means of stolons. The commonest growth-habit, however, is a tuft; and several species, *R. inexpansa* among them, are reported as forming dense stools. An exception to the caespitose habit, as its name connotes, is *R. solitaria*.

The basal leaves are usually linear-elongate, from 1 to 7 mm. in width, or filiform. Commonly they are flat or somewhat canaliculate. The under surface is short-carinate, the keel be-

[1] Mem. Soc. Cubana Hist. Nat. ii. 185 (1916).

coming more prominent toward the apex so that the tip of the leaf is sharply triquetrous. This character is present, but less obvious, in a few species with broad, short leaves, such as *R. ciliaris* and *R. pruinosa*, in which the leaf is abruptly narrowed to an obtuse tip. Rarely the leaf-tips are rounded, as in *R. plumosa.* The angles of the tip, if not the entire margin of the leaf, are always more or less serrated. These microscopic teeth, apparently formed of pure silica, contribute in great part to the material worthlessness of the plants, for they render the leaves unfit for cattle-fodder. In *R. ciliaris* these serrations reach their maximum development as stiff, silvery cilia. Occasionally the leaves are involute, although this condition is difficult to determine from dried specimens. In *R. pruinosa* the leaves are not only canaliculate but also moderately revolute. However, the chief distinction of the leaves of this species lies in their peculiar upper surfaces. These are roughened and bear small white inclusions of lime which are responsible for the rimy or silvery appearance emphasized by the specific name. In another closely related species, *R. scabrata*, the upper surfaces of the leaves are definitely exasperate. The basal leaves vary from stiffly erect to flat and spreading to curling. The curling habit reaches its climax in the circinately coiled leaves of the tiny, depressed *R. crispa.* The CAULINE LEAVES are similar, in most cases, to those of the base. They decrease in size upward and are finally reduced to the setaceous or, less often, somewhat frondose bracts of the inflorescence. The typically closed sheaths are definitive of the *Cyperaceae* as a whole.

The CULMS are usually triquetrous and slender to robust, or filiform and subterete. The 2–several nodes each bear a leaf which may or may not subtend a lateral cluster of spikelets. The internodal surfaces are smooth or striate, and the culms range from stiffly erect to procumbent.

The INFLORESCENCE varies in size from a solitary terminal fascicle, as in *R. pallida*, to a terminal decompound fasciculate cyme which is accompanied by 4–8 smaller lateral cymes, as in *R. miliacea.* Throughout this paper I have applied the term "cyme" to the compound, flat-topped or concave clusters of spikelets which characterize in particular the Series *Caducae.* Compact bundles of mainly ascending spikelets are "fascicles",

whether they are numerous and approximate in the cyme or are solitary and distant in the axils of the cauline leaves. Fascicles may be globose, turbinate or corymbiform, depending upon their shape. Compact masses of spikelets oriented in all directions are heads, capituli or glomerules and may also be of primary or secondary degree. Unfortunately I have not been able to study flowering material of the genus, for from the dried specimens it is difficult to ascertain whether the so-called cymes are determinate, but to all appearances the main axis and the successive axes in turn are terminated by a spikelet.

The SPIKELETS are usually ovoid, but they may be subglobose, as in *R. globularis*, or fusiform as in *R. capillacea*. The lower 2 or 3 of the spirally imbricated scales are comparatively small and empty. The succeeding 1–10 subtend perfect florets, each of which may produce an achene. The terminal 1–2 scales subtend rudimentary florets or are empty. Occasionally the spikelet contains only a single floret.

The SCALES are papery (not indurated), tightly, but more often loosely, imbricate, and persistent or caducous. They are commonly brownish and fairly constant in shade, most commonly castaneous or fuscous. In *R. alba* and several members of the Series *Cernuae* they are whitish; in *R. pallida* they have a reddish tinge. Those of *R. leptorhyncha*, on the other hand, are blackened, as are frequently those of *R. cephalantha* var. *typica*. The general outline of the fertile scales is ovate, on the one hand, to narrowly lanceolate, and on the other to suborbicular. When tightly imbricate they are concave. The midrib frequently extends as a mucro which is often serrulate, and in *R. ciliaris* bears straggly reddish-brown cilia.

The STAMENS are variable in number, from 1–12, but are usually 3. In *R. odorata* the filaments are conspicuously marcescent.

The hypogynous BRISTLES are presumably the remnants of a perianth. They are borne at the base of the achene and are arranged in upper and lower series consisting of 3 bristles each. In *R. alba*, however, the bristles are from 10–12 and in *R. macra* from 18–20. The increase in number is probably due to chorisis; occasionally I have seen an achene of *R. alba* with 2-pronged, presumably imperfectly divided, bristles. The broad, straplike

bristles of the *Glomeratae* are unique, not only in their shape and size, but in their retrorse barbs. In other series the bristles are capillary, or flattened only at the base, and the barbs, or better the minute serrulations, are directed upwards. There are a few forms in the Series *Glomeratae* which, like the species of other series, have bristles with antrorse barbs or with barbs failing. This problem and its importance has been discussed under *R. capitellata* f. *discutiens.* The bristles in the Series *Plumosae* are, as indicated by the name of the series, characteristically plumose. Several species of other series, however, have a few silky hairs at the bases of the bristles. Occasionally the bristles fail to develop. This is true in particular of *R. Chapmanii* and *R. nuda,* and also of occasional achenes of *R. perplexa.*

The STYLE has two stigmatic branches which are characteristic of the genus and which indicate the bicarpellary nature of the gynoecium.

The ACHENE is the most important single character in the determination of a specimen, for, almost without exception, that of every species is distinct. It is derived from the development of one of the paired ovules of the gynoecium at the expense of the other. The shape is commonly ovate, lenticular and biconvex; usually the achene is marginate. Those of species belonging to the Series *Glomeratae* are frequently slenderly prolonged toward the base, forming a gynophore. Other peculiarities of the achenes of this series are the heavy wire-like margins and the prominent central umbo or boss. The umbonate condition also appears in achenes of other series, e. g. *R. Harperi* of the *Fuscae.* More often the central area of the achene is picked out by a smooth, pale disc. This is particularly true of *R. filifolia* the white disc of which has a sheen like that of glass. The achenes of *R. compressa* suggested the specific name, for they are so flattened that they have a shrunken appearance as if they had dried while immature. Some other species with strongly compressed achenes are *R. perplexa, R. schoenoides,* and *R. tenuifolia.* Very few of the series have achenes with an absolutely plain smooth surface. Usually the surface is alveolate or cancellate. The alveoli may, as in the case of the *Chapmaniae,* be reduced to tiny pricks; or they may be shallow, superficial and isodiametric as in the *Harveyae.* The most common modification of the alveoli is that

in which they are more or less aligned across the achene with the transverse walls pulled up into ridges. This produces the rugulose to ridged effect which is common in the Series *Rariflorae, Cernuae, Cubenses, Harveyae, Globulares, Caducae,* and *Glaucae.* Although the surface is ridged the individual alveoli may remain distinct, as in *R. caduca,* or they may be crowded so as to appear only as fine glistening striae between the ridges, or, in *R. tenuifolia,* over the faces of broad corrugations themselves. Like the scales, the achenes are brownish, but they vary in degree from the pale, lustreless shade of *R. nuda* to the dark, gleaming black-mahogany of *R. megalocarpa.* The measurements of the achenes are very dependable, and have been made with the aid of a finely divided steel rule, to tenths of a millimeter. The largest achenes in this section of the genus are those of *R. megalocarpa* (2.8–3.4 mm. wide, 3–4 mm. long). Among the smallest are those of *R. Knieskernii, R. sulcata,* and several species in the *Cernuae* the measurements of which do not exceed a millimeter in width and length.

Occasional trigonous achenes have been seen in the Series *Plumosae* and *Glomeratae.* Such anomalies are accompanied by tripartite styles. They probably represent the last traces of a tricarpellary condition.

The TUBERCLE, consisting of the indurated and persistent base of the style, is triangular and compressed. The achenes of the *Harveyae* which are, for the most part, tumid above, have conical tubercles. These are buttressed and slightly incrusted at the base by the narrowed summit of the achene. The tubercles in the Series *Chapmaniae* are extremely short, often apiculate. The tubercle of *R. compressa* is strongly depressed with a projecting basal flange. The margins of the tubercles in the Series *Fuscae* are thickly setose, and those of other series may be less so, or bare.

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RHYNCHOSPORA Vahl. Scales spirally imbricate; the lower 1 (rarely)–2 to several scales vacant, the following 1–10 subtending perfect florets, the upper 1–2 florets staminate or rudimentary: stamens 1–12, usually 1–3: hypogynous bristles 0–20, when present usually 6: style bilobed at the apex or with 2 long, slender, stigmatic branches: achene more or less compressed, crowned with a conspicuous tubercle consisting of the broad, persistent, indurated base, or even the greater part, of the style.—Chiefly perennials with more or less triangular culms and axillary inflorescences. Species of tropical and subtropical regions of both hemispheres, temperate North America and Eurasia. (Name taken from ‘ρύγχος, a *snout* and σπορά, a *seed*, from the beaked achene.)—Enum. ii. 229 (1806); Gray, Ann. Lyc. N. Y. iii. 194 (1835); Kunth, Enum. ii. 287 (1837); Steud. Cyp. 139 (1855); Bentham & Hooker, Gen. Pl. iii. 1058 (1883); Pax in Engler & Prantl, Pflzfam. ii. 2: 116 (1887); Clarke in Urban, Symb. Ant. ii. 103 (1900); Pfeiffer in Fedde, Rep. Spec. Nov. xxxviii. 89 (1935). *Triodon* L. C. Richard in Persoon, Synops. i. 60 (1805) in a note; nomen rejiciendum. *Phaeocephalum* Ehrh. Beitr. iv. 146 (1789), nomen illegitimum.

Since this paper is limited to a consideration of the Section *Eurhynchospora* the generic definition given above is neither original nor complete; nor has any attempt been made to include in the list of generic synonyms the numerous tropical genera of Nees, none of which come within the scope of this paper.

In 1935 the name *Rhynchospora*[1] was conserved over *Triodon* L. C. Richard, which threw into synonymy all previous combinations made by Farwell[2] under *Triodon*. House[3] in 1920 at-

[1] Int. Rules Bot. Nomencl. 90 (1935).

[2] Rep. Mich. Acad. Sci. xv. 167 (1913); xix. 253 (1917).

[3] Am. Midland Nat. vi. 201 (1920).

tempted to set up the generic name *Phaeocephalum* Ehrh., but the name is excluded by the International Rules, under Art. 67 (3), as a unitary designation of species, not intended as a generic name.

However, at present the status of the generic name is once again challenged, for Pfeiffer[1] has brought up the problem of the inclusion of *Pleurostachys* Brongn.[2] and *Dichromena* Michx.[3] within the genus. Whether Pfeiffer's solution, which reduces both genera to the status of synonyms under *Rhynchospora*, is sound, I do not know. It is a problem for the student of the *Rhynchosporeae* as a whole. However, the name *Dichromena* has priority over *Rhynchospora*, and the inclusion of the two under one generic name would necessitate either the transfer of the species of *Rhynchospora* to *Dichromena*, following the precedent of Macbride[4], or the conservation of the name *Rhynchospora* over *Dichromena* as proposed by Pfeiffer[5], with the necessary combinations under *Rhynchospora*, many of which have already been made by that author.

Subgenus Distylis Pax. Style deeply cleft; stigmatic branches linear, equal in length to the undivided portion of the style.—In Engler & Prantl, Pflzfam. ii. 2: 117 (1887). *Rhynchospora* 3. *Communes* Kunth, Enum. ii. 295 (1837). *Rhynchospora* ii. *Dichostyleae* Bentham & Hooker, Gen. Pl. iii. 1060 (1883). *Rhynchospora* Series B. *Diplostyleae* Clarke in Urban, Symb. Ant. ii. 104 (1900). Subgenus *Diplostylis* Pfeiffer in Fedde, Rep. Spec. Nov. xxxviii. 91 (1935).

Section Eurhynchospora Griseb. Scales thin and papery, not indurate, often loosely imbricate: bristles 0 (rarely)–20, usually 6 and equal to or exceeding half the achene in height, if bristles consistently failing achenes smooth (e. g. *R. Chapmanii*, *R. nuda*): achenes commonly ovate in outline, lenticular and gradually biconvex or umbonate, less often subglobose; surface smooth to strongly alveolate to striate and ridged: tubercle discrete, triangular or conical, compressed.—Goetting. Abh. vii. 272 (1857); Bentham & Hooker, Gen. Pl. iii. 1060 (1883); Pfeiffer in Fedde, Rep. Spec. Nov. xxxviii. 91 (1935). *Rhynchospora* Series B. *Diplostyleae*, Divisio 5. *Eu-Rhynchospora* Clarke in Kew Bull. Add. Ser. viii. 119 (1908). *Rhynchospora* ii. Subgenus *Eurhynchospora* Clarke ex Britton, Trans. N. Y. Acad. Sci. xi. 85 (1892).

[1] Fedde, Rep. Spec. Nov. xxxviii. 88 (1935); xliii. 258 (1938).
[2] Brongniart in Duperr. Voy. Coq. Bot. 172 t. 31 (1829).
[3] Fl. Bor.-Am. i. 37 (1803).
[4] Field Mus. Pub. Bot. iv. 166 (1929); viii. 113 (1930); xi. 5 (1931); xiii. 301 (1936).
[5] Fedde, Rep. Spec. Nov. xliii. 261 (1938).

Key to Series in Section Eurhynchospora

a. Bristles retrorsely barbed, or if barbs antrorse or failing, bristles robust, straplike, pale, exceeding the achene. 1. Series *Glomeratae*.

a. Bristles antrorsely barbed or failing, rarely smooth, then capillary and fragile. . . .*b*.

b. Bristles well developed and heavily plumose for at least ½ their length or reduced to six basal tufts. . . . .2. Series *Plumosae*.

b. Bristles upwardly serrulate with or without a few basal hairs, rarely smooth. . . .*c*.

c. Surface of achene smooth or pricked by small dark pits; achene chestnut-brown or dark brown (then lenticular and moderately biconvex), not tumid. . . .*d*.

d. Surface of achene pricked by tiny dark pits or, if surface smooth, bristles 1–3 and rudimentary or failing; lateral fascicles rare, with exception of 1–3 in *R. brachychaeta*. . . . . .3. Series *Chapmaniae*.

d. Surface of achene smooth; bristles 6 and well developed except in *R. fascicularis* var. *typica* and *R. debilis* where they are often 5 to 6 and rudimentary; lateral fascicles present in well developed specimens. . . .*e*.

e. Achenes small, usually less than 1 mm. wide, light brown, pyriform or narrowly ellipsoid with the maximum width near the apex. . . . . .4. Series *Fuscae*.

e. Achenes exceeding 1 mm. in width (with the exception of that of *R. Fernaldii* which is minute and blackish), broadly ovate in outline, their maximum width corresponding to their midpoint. .5. Series *Fasciculares*.

c. Surface of achene transversely rugulose to ridged, or with alveoli forming a honeycomb-pattern, if rarely smoothish then brown and tumid to subglobose. . . .*f*.

f. Culm terminated by an ovoid glomerule or spiciform cyme, or cymes, if compound corymbiform, small, with relatively few often straw-colored spikelets; culms relatively short to depressed. . . .*g*.

g. Spikelets remote on capillary pedicels; cymes corymbiform, spreading; 2 species only, both of the Coastal Plain, *R. rariflora* also in the West Indies 6. Series *Rariflorae*.

g. Spikelets approximate, if rarely pedicellate then strongly ascending; species limited to the West Indies. . . . . .7. Series *Cernuae*.

f. Culm terminated by a compound, usually decompound, glomerulose, corymbiform, congested or loose cyme; culms relatively tall, rarely depressed. . . .*h*.

h. Spikelets with 1 floret, the solitary achene terminating its axis; achene longitudinally wrinkled as if shriveled; 2 species of the Greater Antilles 8. Series *Cubenses*.

h. Spikelets with 2–several florets, one of which may be a terminal rudiment; achene not longitudinally wrinkled; many species of the Coastal Plain and the West Indies. . . .*i*.

i. Achene surmounted by a grayish, conical-apiculate tubercle with a subterete base which is slightly buttressed and often slightly incrusted by the narrowed neck of the achene; surface of achene

deeply alveolate and ridged only in *R. cullixa*, otherwise mahogany-brown, smoothish or with a honeycomb-pattern of shallow isodiametric alveoli . . . . 9. Series *Harveyae.*

i. Achene usually surmounted by a deltoid, compressed tubercle which is often attenuate, if conical-discoid and projecting at the base not visibly buttressed . . . . *j.*

j. Achene broadly obovoid or slenderly ellipsoid-obovoid, dull, castaneous or catching the light in the prominent, deeply etched alveoli, usually ridged . . . . *k.*

k. Cymes stiff, erect or spreading; branchlets terminating in glomeruli which may be dense or limited to 3–4 globose spikelets 10. Series *Globulares.*

k. Cymes usually flexuous, corymbiform, densely fasciculate (except for the stiff, open netlike cymes of *R. miliacea*), occasionally glomerulose in reduced phases of *R. microcarpa* . . . . 11. Series *Caducae.*

j. Achene pyriform, often slenderly so, yellowish-brown to light brown, usually glossy; the surface alveoli reduced to longitudinal striae which are intercepted by transverse corrugations or vague rugulosities . . . . 12. Series *Glaucae.*

Series 1. Glomeratae Small, emend. Plants of acid bogs of temperate North America and Eurasia with several species limited to the Coastal Plain; *R. alba* also in the mountains of Puerto Rico and (?) northeastern Brazil. Habit caespitose: leaves filiform to flattish and up to 5 mm. wide: culms capillary to stout, usually stiffly erect: inflorescence of 1 terminal and 1 to more (often several) lateral fascicles or glomerules, rarely cymose-fasciculate: spikelets 1–2-fruited: scales acute to mucronate, tightly or loosely imbricate: achene pyriform or with a conspicuous gynophore, smooth to granular or faintly rugulose, usually with a pale central disc; bristles 6, retrorsely barbellate, or if with barbs antrorse or failing the bristles robust, straplike and pale.—*Rhynchospora*, V. *Glomeratae* Small, Man. 175 (1933), in part. *Rhynchospora*, Series B. *Diplostyleae* Sect. 3. *Albae* Clarke in Urban, Symb. Ant. ii. 105 (1900).

Key to Species in Series Glomeratae

a. Achenes with a conspicuous, pale, wirelike margin, smooth, castaneous and unlined, usually lustrous, umbonate, with a pale disc and basally prolonged . . . . *b.*

b. Spikelets 1-fruited, the solitary achene terminating the axis . . . . *c.*

c. Inflorescence of 2–6 dense, globose glomerules (rarely subhemispherical and looser on poorly developed specimens), the crowded spikelets ascending to reflexed . . . . *d.*

d. Achenes minute, 0.9–1.1 mm. wide, 1.4–1.6 mm. long
1. *R. microcephala.*
d. Achenes 1.1–1.6 mm. wide, 1.8–2.5 mm. long....2. *R. cephalantha.*
c. Inflorescence of 3–7 turbinate to loosely hemispherical fascicles, the loosely aggregated spikelets ascending to divergent...................................3. *R. chalarocephala.*
b. Spikelets usually 2- or more-fruited, or if one-fruited the achene always succeeded by a rudimentary floret....*e.*
e. Achene prominently umbonate, with a pale disc, depressed sides and raised wire-like margins; inflorescence of usually several strict, fasciculate, rarely glomerulose, cymes.......................................4. *R. glomerata.*
e. Achene gradually rounded without a prominent umbo, surface a uniform brown, margins narrow; inflorescence of 2–6 compact, irregularly lobed fascicles, less often cymose-fasciculate..........................5. *R. capitellata.*
a. Achenes inconspicuously marginate, finely granular to slightly rugulose, dark brown toward the margins from which short, dark, broken lines run in between the roughenings toward a more or less definite pale, polished disc....*f.*
f. Bristles 10–20, usually sparingly plumose at base....*g.*
g. Bristles 10–12; achenes 0.9–1.2 mm. wide, 1.6–1.8 mm. long; spikelets several-fruited or, if 1-fruited, with terminal rudimentary floret; scales typically whitish 6. *R. alba.*
g. Bristles 18–20; achenes 1.3–1.4 mm. wide, 2–2.1 mm. long; spikelets 1-fruited, without a terminal rudimentary floret; scales rusty.........................7. *R. macra.*
f. Bristles 6, serrulate, not plumose at base....*h.*
h. Achene pyriform, not basally prolonged; fascicles 3–4, borne along the entire length of the culm......8. *R. Knieskernii.*
h. Achene oblong-elliptic, with a very slender gynophore; fascicles 1–2, limited to the upper portion of the culm
9. *R. capillacea.*

1. R. MICROCEPHALA Britt. ex Small. Caespitose: leaves 1–3 mm. wide, narrowly linear, closely ascending, erect, becoming minutely serrulate and triquetrous toward the tips: culms subterete, smooth, slender, erect to flexuously ascending, 3.3–8.4 dm. high: spikelets crowded into 1 terminal and 2–5 lateral, densely globose, or less frequently looser, subhemispherical heads 1.1–1.8 cm. wide, on included peduncles: spikelets slenderly lanceolate-attenuate, sessile, ascending to reflexed, typically forming a solid echinate ball, 1-fruited; the solitary fertile floret terminal with no trace of a sterile rudiment: scales ovate to lanceolate, acute, chestnut to dark brown, tightly inrolled especially at the apices: bristles 6, straplike, retrorsely barbellate; their apices convergent about the tubercle which they slightly exceed: achene 0.9–1.1 mm. wide, 1.4–1.6 mm. long; its body suborbicular, with a short but narrow and distinct gynophore; surface smooth, lustrous, brown, with a prominent light umbo and a raised wirelike margin: tubercle subulate-attenuate, 0.7–1.1 mm. high; its base not wholly covering the summit of the achene. PLATE 818, FIGS. 3A and 3B; MAP 4.—Fl. 195, 1327 (1903) and Man. 181 (1933); Fernald, RHODORA, xxxvii. 404, pl.

391, figs. 4 and 5 (1935); Fernald & Gale, Rhodora, xlii. 428, figs. 3 and 4 (1940). *R. axillaris* var. *microcephala* Britton, Trans. N. Y. Acad. Sci. xi. 89 (1892); Britton & Brown, Ill. Fl. i. 279 (1896); Britton, Man. 185 (1901); Robinson & Fernald in Gray, Man. ed. 7: 201 (1908). *R. axillaris* sensu Britton in Britton & Brown, Ill. Fl. ed. 2: i. 344 (1913), in part; Britton, Mem. Soc. Cubana Hist. Nat. ii. 195 (1916), not as to name-bringing syn. *Schoenus axillaris* Lamarck.—Wet peaty or sandy clearings, swamps and pond-margins of the Coastal Plain from New Jersey southward to the Florida Peninsula, thence west to Mississippi; also in western Cuba. New Jersey: east of Parkdale (2 miles), Atlantic Co., Aug. 17, 1905, *Van Pelt* (P); Monmouth Co., 1845, *Knieskern* (NY, type of *R. axillaris* var. *microcephala*). Delaware: Indian River, Millsboro, Sussex Co., Sept. 21, 1907, *Brown* (P). Washington, District of Columbia: Sept. 18, 1901, *Steele* (NY). Maryland: Salisbury, Wicomico Co., Sept. 28, 1863, *Commons* (G, P). Virginia: sphagnous magnolia swamp at head of Garnett Creek, about 1 mile northeast of St. Stephen's Church, King and Queen Co., *Fernald & Long*, no. 13275 (G); fresh to brackish swales along North Landing River, near Creed's, Princess Anne Co., *Fernald, Long & Fogg*, no. 4830 (G, P); wet peaty clearings in woods of *Pinus serotina*, south of Grassfield, Norfolk Co., *Fernald & Long*, no. 3785 (G, P); moist sandy and peaty pine barrens south of Lee's Mill, Isle of Wight Co., *Fernald & Long*, no. 12592 (G); wet depressions in sandy pine barrens near Cox Landing, Nansemond Co., *Smith & Hodgdon* in Pl. Exsic. Gray., no. 923 (G, NY, P); sandy border of wooded swamp about 3 miles northwest of Ivor, Southampton Co., *Fernald & Long*, no. 6091 (G, P); sphagnous bog about 1 mile northwest of Dahlia, Greensville Co., *Fernald & Long*, no. 8992 (G, P). North Carolina: pineland, 3 miles north of Winton, Hertford Co., *Godfrey*, no. 5206 (G); moist rich soil, recently cleared land, Williamston, Martin Co., *Randolph & Randolph*, no. 694 (G); wet grassy railroad-ditch, 1 mile east of Balley, Wilson Co., *Oosting*, no. 1670 (CU, D); savanna at Chocowinity, Beaufort Co., *Godfrey*, no. 5415 (G); wet sandy soil, roadside near Carteret Co. Line on road to Maysville, Jones Co., *Beaven*, no. 499 (D); moist open sandy soil, north side of White Lake, Bladen Co., *Blomquist*, no. 10859 (CU); low boggy soil between Coats and Erwin, Harnett Co., *Correll & Blomquist*, no. 2537 (CU, D, G); edge of pocosin, Southport Supply Road, Brunswick Co., *Oosting*, no. 33722a (D); Cumberland Co., *Blomquist*, no. 5647 (D); marsh at Springfield, Scotland Co., *Godfrey*, no. 5098 (G). South Carolina: near Kershaw, Lancaster Co., *House*, no. 2618 (NY); wet soil, Hartsville, Darlington Co., July 12, 1920, *Norton* (NC); sandy drainage-ditch, 2 miles west of Salters, Williamsburg Co.,

Godfrey & Tryon, no. 502 (D, G, NY); Sumter Co., *Holdaway*, no. 11 (D); boggy swale, 5 miles south of Columbia, Lexington Co., *Godfrey & Tryon*, no. 1263 (G). Georgia: Cypress Pond, Bethesda Church, Effingham Co., *Eyles*, no. 6398 (CU); Chase Prairie, Okefenokee Swamp, Charlton Co., *J. S. Harper*, no. 731 (G). Florida: South Jacksonville, Duval Co., Aug. 11, 1909, *Lang* (P); low pineland bordering Lake Geneva, near Keystone Heights, Clay Co., Feb. 24, 1925, *O'Neill* (CU); margin of pond along west boundary of Welaka, Putnam Co., June 26, 1940, *Laessle* (CU); in a low pineland, 7 miles north of Ft. Christmas, east of Orlando, Orange Co., *O'Neill*, no. 7679 (CU; US, without number); wet ditch, Lake Jovita, Pasco Co., *O'Neill*, no. 2609 (NY); flatwoods, 1 mile from Tiger Lake, Polk Co., *McFarlin*, no. 3466 (CU); ditch, Hardee Co., July 29, 1940, *Schallert* (G); margins of ponds in pine barrens, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 864b (G, in part). Alabama: in a wet place, Perdue, Coffee Co., *Blanton*, no. 83 (US). Mississippi: Petit Bois Island, Jackson Co., *Tracy*, no. 4884 (NY, US); Biloxi, Harrison Co., *Tracy*, no. 1361 (NY). Cuba: in a belt of a species of *Andropogon*, Laguna Tobero, Remates, *Ekman*, no. 11357 (NY); wet soil, Laguna los Indios and vicinity, Pinar del Rio, *Shafer*, no. 10810 (NY) and 10819 (US); in floating islands, at a laguna west of town, La Grifa, Pinar del Rio, *Ekman*, no. 11274 (US); deposited on the shore of the laguna, Laguna Santa Maria, Pinar del Rio, *Ekman*, no. 17240 (NY).

2. R. cephalantha Gray. Caespitose: leaves 1–4.5 mm. broad, flat or tending to become inrolled on drying, serrulate on upper margins, erect; radical leaves equalling about ⅓ the culm; cauline leaves short: culms slender to stout, erect, obtusely trigonous, 0.4–1.1 m. tall: inflorescence 1–5 dm. long; glomerules densely subglobose to loosely hemispherical, 1–2.2 cm. wide, terminal and solitary or accompanied by 1–4 smaller lateral glomerules on subincluded peduncles: bracts foliaceous and conspicuous: spikelets ovoid, 4–6 mm. long, compact, sessile; the fertile floret consistently terminal and solitary with no trace of a succeeding rudimentary floret: scales castaneous to blackish, slightly mucronate, so tightly involute at their apices as to give an echinate appearance to the glomerule: bristles 6, robust, strap-like, with the margins and upper surfaces retrorsely barbed, stramineous to light brown, equalling to slightly exceeding the tubercle around which they converge: achene 1.1–1.6 mm. broad, 1.8–2.4 mm. long; its body suborbicular, usually with definite shoulders, lenticular and prominently umbonate, with a very slender gynophore; the sides depressed and rimmed by a raised wire-like margin; surface smooth, lustrous, castaneous, paler over the umbo: tubercle compressed, subulate-attenuate, 1.4–2.4 mm. long.

KEY TO THE VARIETIES OF R. CEPHALANTHA

Achenes 1.4–1.6 mm. wide, 2–2.5 mm. long; habit usually stiffly erect; culms often robust.
Glomerules subglobose to loosely hemispherical, 1–3 (rarely 4 with the lowermost poorly formed); culms slender to stoutish 2a. var. *typica.*
Glomerules densely subglobose, 4–7 in number, the lowest remote; culms stout. . . . . .2b. var. *pleiocephala.*
Achenes 1.1–1.2 mm. wide, 1.8 mm. long; habit weakly erect; culms slender, attenuated in appearance. . . . . .2c. var. *attenuata.*

2a. Var. TYPICA Fernald & Gale. Leaves 1.5–2.5 (–3) mm. broad, tending to become inrolled on drying: culms slender, 0.4–1 m. in height: inflorescence 1–2.8 dm. long (rarely longer) comprising about ⅕ the culm; glomerules subglobose to loosely hemispherical, 1.3–2.2 cm. wide, terminal and solitary or accompanied in the upper axils by 1–2 (rarely 3) smaller glomerules, then only the terminal glomerule subcompound to several-lobed: achene 1.4–1.6 mm. broad, 2–2.4 mm. long. PLATE 818, FIGS. 4A and 4B; MAP 7.—RHODORA, xlii. 423 (1940). *R. cephalantha* Gray, Ann. Lyc. N. Y. iii. 218, pl. 6, fig. 30 (1835) and Man. 533 (1848), in part var. *pleiocephala,* as with later authors; Chapman, Fl. So. U. S. 528 (1860); Fernald, RHODORA, xxxvii. 403, pl. 391, figs. 2 and 3 (1935). *R. axillaris* Britton, Bull. Torr. Bot. Cl. xv. 104 (1888) and Trans. N. Y. Acad. Sci. xi. 89 (1892), in part var. *pleiocephala,* as with later authors, not as to name-bringing syn. *Schoenus axillaris* Lam.; Britton & Brown, Ill. Fl. i. 279, fig. 655 (1896); Britton, Man. 185 (1901); Small, Fl. 195 (1903) and Man. 181 (1933); Robinson & Fernald in Gray, Man. ed. 7: 201, fig. 327 (1908). *Phaeocephalum axillare* House, Am. Midland Nat. vi. 201 (1920).—Sphagnous bogs of southern New Jersey, southward on the Coastal Plain to Georgia, thence west to eastern Louisiana. NEW JERSEY: bog southeast along P. R. R., Bombat, Ocean Co., Aug. 25, 1909, *Long* (P); east of Parkdale, Atlantic Co., Aug. 17, 1905, *Van Pelt* (P); *Gray* ?, no. 1 (NY, TYPE; accompanied by notes in Gray's handwriting); natural bog along Mullica River about 1.5 miles southeast of Atsion, Burlington Co., *Fogg,* no. 5662 (G). DELAWARE: swamps along Queen Anne Railroad, near Ellendale, Sussex Co., Aug. 17, 1899, *Commons* (P). MARYLAND: open white gravel bog, Powder Mill Bogs, near Lewiston, Prince George Co., *Blake,* no. 10670 (CA). VIRGINIA: argillaceous and siliceous boggy depression southeast of Petersburg, at head of Poo Run, Prince George Co., *Fernald & Long,* no. 6090 (G, P); depression in argillaceous woods west of Winfield's Mill, Dinwiddie Co., *Fernald & Long,* no. 13902 (G); sphagnous argillaceous boggy depression just north of Wakefield, Sussex Co., *Fernald & Long,* no. 7352 (G, P); sphagnous bog about 1 mile northwest of Dahlia, Greensville Co., *Fernald & Long,* no. 8993 (G, NY, P).

North Carolina: sphagnous bog at Method, Wake Co., *Godfrey*, no. 4985 (CA, D, G); drainage-ditch at Carolina Beach, New Hanover Co., *Godfrey*, no. 4719 (G, NC); roadside-ditch between Beaufort and Atlantic, Carteret Co., *Blomquist*, no. 11300 (D). Georgia: cypress-pond, Bethesda Church, Effingham Co., *Eyles*, no. 6397 (CU); edge of cypress-pond, near Smithville, Lee Co., *Eyles*, no. 1711 (CU). Louisiana: in low pine barrens, St. Tammany Parish, Sept. 14, 1892, *Langlois* (US).

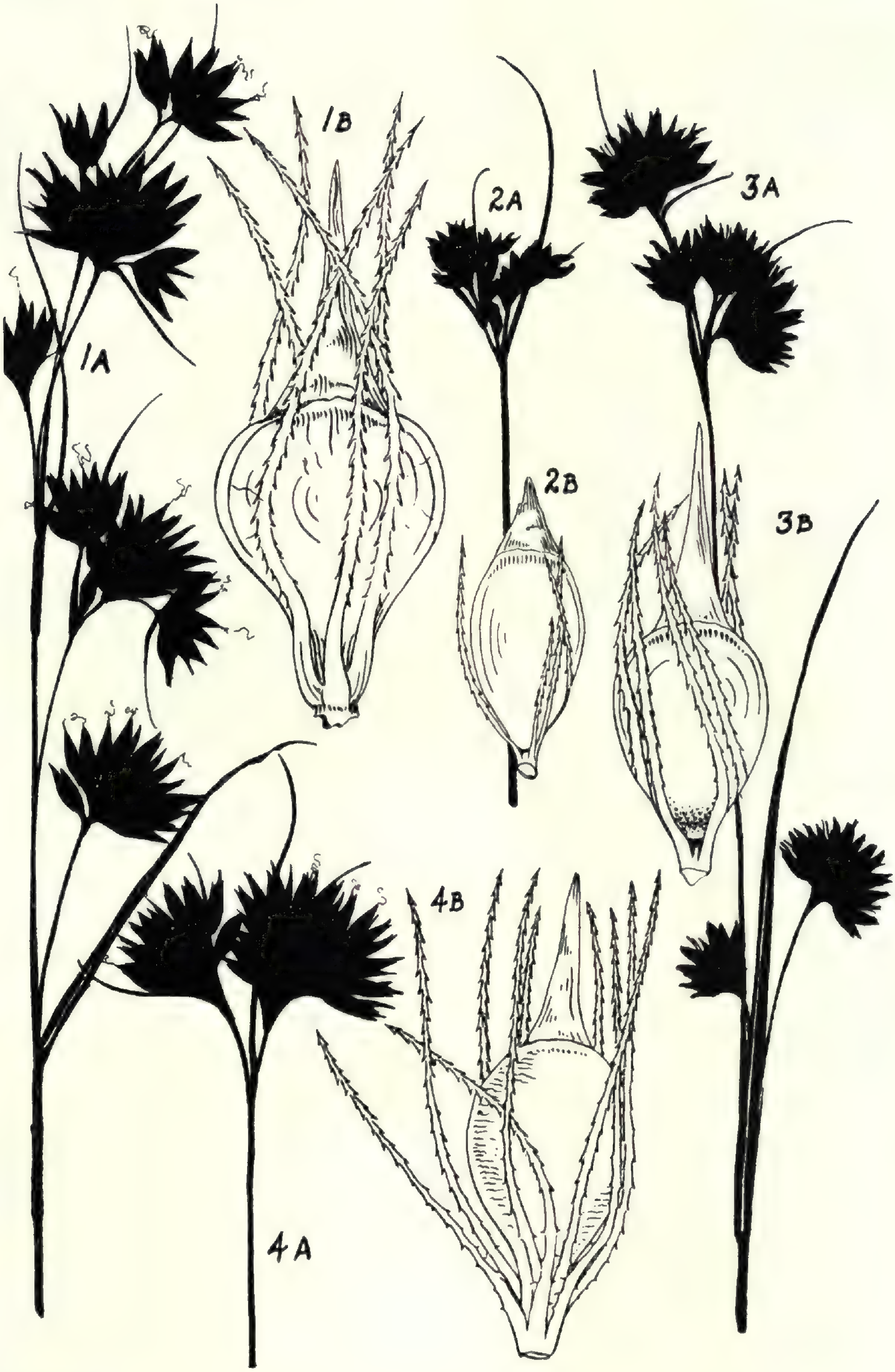
Forma **antrorsa,** f. nov. Setis antrorse hispidulis.—Occasional in range of the typical form. New Jersey: Hammonton, Atlantic Co., Aug. 4, 1907, *Bartram* (P); Parkdale, Camden Co., Sept. 18, 1916, *Pennell*, no. 9032 (NY); Quaker Bridge, Burlington Co., Sept. 3, 1867, *Parker* (G, in part the typical form; US); same locality, Aug. 18, 1866, *Diffenbaugh* (P); border of cranberry bog along Little Hauken Creek, North Jenkins, Burlington Co., July 28, 1937, *Long*, no. 50858 (P); Symmes' Place 3 miles west of Cedar (Warren) Grove, Burlington Co., *Stone*, no. 14517 (P). Delaware: Ellendale, Sussex Co., Aug., 1874, *Canby* (G, NY, US); same locality, July 9, 1908, *Van Pelt* (P); sandy swamps near Georgetown, Aug. 26, 1897, *Commons* (P). North Carolina: savanna 5 miles east of Jacksonville, Onslow Co., Aug. 6, 1938, *Godfrey*, no. 5808 (G, type). South Carolina: drainage ditch, 3 miles north of McClellanville, Charleston Co., July 19, 1939, *Godfrey & Tryon*, no. 677 (G); grass-sedge bog or savanna, 12 miles north of Georgetown, Georgetown Co., Aug. 2, 1939, *Godfrey & Tryon*, no. 752a (D, G, NY).

2b. Var. pleiocephala Fernald & Gale. Leaves 2.5–4.5 mm. broad, flat: culms stout, 0.6–1.1 m. high: inflorescence 1.4–5 dm. long, comprising ¼–½ the culm; glomerules 4–7, densely subglobose, 1.8–2 cm. wide, 1–3 borne in the terminal and preceding axil, remainder remote: spikelets fulvous to castaneous. Map 5.—Rhodora, xlii. 424 (1940). *R. cephalantha* of earlier authors in part.—Exsiccated pond-holes and swampy ground of the Coastal Plain from southeastern Virginia to eastern Louisiana. Virginia: abundant and dominating an exsiccated argillaceous pond-hole in woods, about 1 mile south of Mercy Seat Church, Surry Co., *Fernald & Long*, no. 8994 (G, type; NY and P, isotypes); dominant in flat sphagnous pinelands, Collier's Yard, 3–4 miles southwest of Petersburg, Dinwiddie Co., *Fernald & Long*, no. 10548 (G); pond-hole in pine and oak woods near Three Creek, north of Emporia, Greensville Co., *Fernald & Long*, no. 9283 (G, P). North Carolina: moist swampy ground, Manteo-Wancheese, Roanoke Island, Dare Co., *Blomquist*, no. 7500 (D); low pineland at Dunn, Harnett Co., *Godfrey*, no. 6122 (D, G); in burned pocosin 5 miles north of White Lake, Bladen Co., *Blomquist*, no. 10872 (D, G); ditches near Wilmington, New Hanover Co., *Biltmore Herb.* no. 279a (G, NC, US); moist place

in savanna, Southport, Brunswick Co., Aug. 13, 1930, *Blomquist* (D); pineland at Nakina, Columbus Co., *Godfrey*, no. 6347 (G). South Carolina: sandy drainage ditch, 2 miles west of Salters, Williamsburg Co., *Godfrey & Tryon*, no. 504 (D, G, NY, P); grass-sedge bog or savanna, 12 miles north of Georgetown, Georgetown Co., *Godfrey & Tryon*, no. 1061 (G, NY, P); boggy ditch in pine barrens, 2 miles east of Meggetts, Charleston Co., *Wiegand & Manning*, no. 582 (G). Georgia: Waycross, Ware Co., Aug. 18, 1909, *Lang* (P); pine barrens, near Lem Griffin's Camp, Okefenokee, Clinch Co., *Eyles*, no. 133 (CU); cypress head, Valdosta, Lowndes Co., May 27, 1940, *Sargent* (Sargent Herb.); wet meadow, Leslie, Sumter Co., *Harper*, no. 413 (G, NY, US). Florida: swampy places in pine barrens near Jacksonville, Duval Co., *Curtiss*, no. 5016 (G, US); cypress swamp, vicinity of Eustis, Lake Co., *Nash*, no. 845 (CU, G, NY, P, US); swamp, Okefenokee region, Brevard Co., *Fredholm*, no. 5821 (G); bogs and shady swamps, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 279b (G, NY). Alabama: Miflin Creek, vicinity of Elberta, Baldwin Co., Aug. 21, 1925, *Wolf* (StB); in a wet place, Perdue, Coffee Co., *Blanton*, no. 83 (CA); ditches and swampy thickets, Mobile, Mobile Co., June, 1878, *Mohr* (US). Mississippi: Ocean Springs, Jackson Co., *Tracy*, no. 96 (NY); Wisdom, Harrison Co., *Tracy*, no. 3418 (G, NC, NY, US); open pine woods, 2 miles west of Bay of St. Louis, Hancock Co., *Correll & Correll*, no. 9103 (D). Louisiana: pine flatwoods west of Covington, St. Tammany Parish, *Brown*, no. 6649 (La); open pineland north of Abita Springs, St. Tammany Parish, *Pennell*, no. 4137 (D, NY, P); low moist grassy soil of open prairie, 3 miles east of Robert, Tangipahoa Parish, *Correll & Correll*, no. 9217 (D).

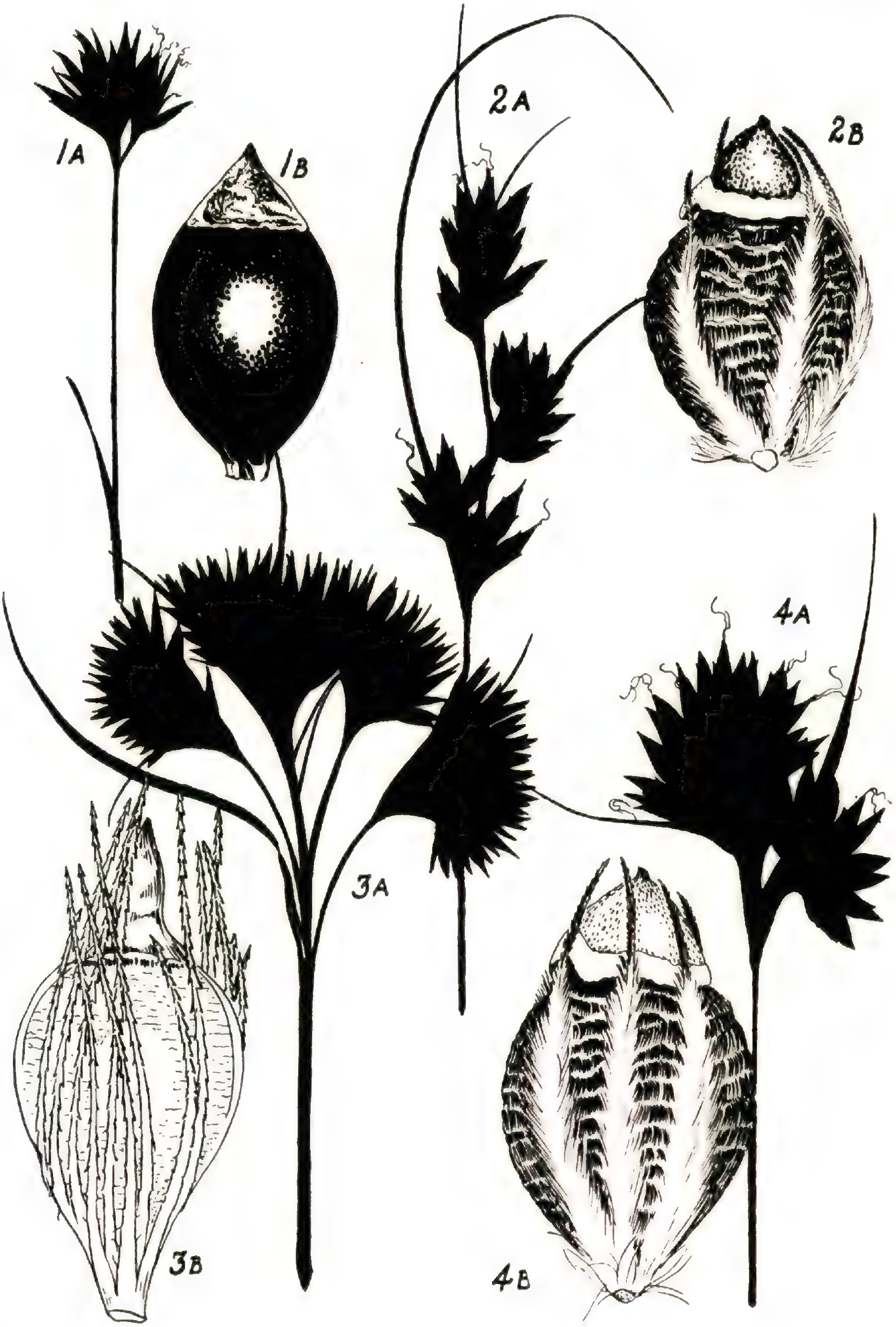
Forma **controversa,** f. nov. Setis antrorse hispidulis.—Infrequent in the range of the typical form. South Carolina: drainage ditch, 3 miles north of McClellanville, Charleston Co., *Godfrey & Tryon*, no. 675 (G); grass-sedge bog or savanna, 12 miles north of Georgetown, Georgetown Co., *Godfrey & Tryon*, no. 752 (G, type; NY, isotype); shallow peaty pond in pine barren, 9 miles north of Georgetown, Georgetown Co., *Godfrey & Tryon*, no. 759 (D, G).

Var. **attenuata,** var. nov. Foliis 1–3 mm. latis planis: culmis 6–8 dm. altis gracilibus attenuatis: inflorescentia 2.2–3 dm. alta, culmo duplo vel triplo breviore; glomerulis 3–5 laxe subglobosis vel subhemisphaericis, 1–1.8 cm. latis: spiculis 4–4.5 mm. longis castaneis: achaenio 1.1–1.2 mm. lato 1.8 mm. longo: tuberculo 1.4–1.8 mm. alto. Map 6.—Swamp-margins and moist pinelands of the Coastal Plain of the Carolinas (rare), Mississippi and Alabama. North Carolina: Wilsons Mills, Johnston Co., *Ashe* (NC). South Carolina: flats across from paper mill,



S. G. del.

Rhynchospora glomerata var. typica: fig. 1A, portion of inflorescence, × 2; fig. 1B, achene, × 20.
R. Knieskernii: fig. 2A, portion of inflorescence, × 2; fig. 2B, achene, × 20.
R. capitellata: fig. 3A, inflorescence, × 2; fig. 3B, achene, × 20.
R. alba: fig. 4A, portion of inflorescence, × 2; fig. 4B, achene, × 20.



S. G. del.

Rhynchospora sola: fig. 1A, inflorescence, × 2; fig. 1B, achene, × 20.
R. plumosa: fig. 2A, inflorescence, × 2; fig. 2B, achene, × 20.
R. macra: fig. 3A, portion of inflorescence, × 2; fig. 3B, achene, × 20.
R. intermedia: fig. 4A, inflorescence, × 2; fig. 4B, achene, × 20.

Hartsville, Darlington Co., July 5, 1909, *Coker* (NC). ALABAMA: in a wet place, Perdue, Coffee Co., Aug. 23, 1933, *Blanton*, no. 83 (G, TYPE; CU, US, ISOTYPES); about swamp, Elberta, Baldwin Co., Aug. 21, 1926, *Wolf* (StB); common in swamp, Spring Hill, Mobile Co., Aug. 6, 1897, *Bush*, no. 243 (NY, US); moist sandy pineland, Theodore, Mobile Co., Aug. 30, 1912, *Pennell*, no. 4423 (NY, P); Mobile, Mobile Co., July 20, 1897, *Baker*, no. 843 (NY). MISSISSIPPI: Ocean Springs, Jackson Co., Aug. 21, 1889, *Tracy*, no. 124 (NY); same locality, July 18, 1891, *Earle* (NY); same locality, Aug. 27, 1891, *Seymour*, no. 8 (CA, G, NC); Biloxi, Harrison Co., July 31, 1900, *Tracy*, no. 6993 (G); same locality, July 25, 1892, *Tracy*, no. 1361 (G, US).

An examination of *R. microcephala* Britt. ex Small and *R. cephalantha* var. *pleiocephala* from the coastal areas of the Carolinas, Mississippi and Alabama has brought to light the existence of certain specimens, the achenes of which are smaller than those of the already known varieties of *R. cephalantha*, but larger than those of *R. microcephala*. At first sight these specimens appear as intermediate between the two species mentioned and suggest, as preferable, a restoration of Britton's *R. cephalantha* var. *microcephala*. However, one would expect these southern plants, if truly intermediate, to present a series of achenes ranging in size from those of *R. microcephala* to those of *R. cephalantha*. Actually, however, the achenes of these specimens appear to be of a definite size larger than those of the former, smaller than those of the latter species. The glomerules of this southern variety are from 2–4, hemispherical and indistinguishable from the occasionally smaller, looser, hemispherical glomerules of *R. cephalantha*. I am, therefore, assigning it to *R. cephalantha* as var. *attenuata*, to be distinguished from var. *typica* and var. *pleiocephala* primarily by its smaller achene; secondarily by its attenuated appearance, consistently weak glomerules and restricted southern range.

3. R. CHALAROCEPHALA Fernald & Gale. Caespitose: leaves 1– (rarely) 2 mm. wide, flat, crowded, erect; upper margins often minutely serrulate; tips triquetrous: culms subterete, slender to rarely stout, 1.8–8.3 dm. high: fascicles 3–7, remote, the majority 2–5 lobed; the terminal fascicle turbinate to loosely subhemispherical, 0.9–1.8 cm. in diameter; lateral fascicles consistently turbinate, on included peduncles: spikelets lanceolate in outline, loosely aggregated, ascending to divergent; the fertile floret solitary, abruptly terminating the axis of the spikelet: scales

lanceolate, acute, tightly imbricate about the achene and tubercle: bristles 6, robust, strap-shaped, retrorsely barbellate, erect, equalling the tubercle to slightly exceeding it: achene obovoid, lenticular, 0.9–1 mm. wide, 1.4–1.7 mm. long, with more or less definite shoulders and a drawn-out excessively slender gynophore; surface smooth, shining, umbonate, with depressed sides and a raised wirelike margin: tubercle subulate-attenuate, compressed, 1–1.6 mm. long; its base much narrower than the apex of the achene. Plate 818, figs. 1A and 1B, Map 8.—Rhodora, xlii. 426, figs. 1 and 2 (1940).—Swamps, lake-borders and roadside ditches of the Coastal Plain from the New Jersey pine barrens to Florida. New Jersey: wet pine barrens, Sims Place, Burlington Co., *Drushel & Svenson*, no. 6860 (G); Parkdale, Camden Co., *S. Brown*, no. 56 (P); peaty and sphagnous pond-hole depression near Hardingville, Gloucester Co., *Long*, no. 47134 (P); moist pine barrens, Egg Harbor City, Atlantic Co., *Mackenzie*, no. 5558 (NY); Maurice River flats east of Vineland, Cumberland Co., Aug. 12, 1923, *Bassett & Long* (P); wet peaty pond-hole about 1 mile west of Bennett, Cape May Co., *Long*, no. 23488 (P). Delaware: moist soil, Lewes, Sussex Co., Aug. 15, 1895, *Commons* (P); burned swamp, standing water, near Maryland line, *Beaven*, no. 69 (D). Maryland: marsh in abandoned mill pond near Sharptown, Wicomico Co., *O'Neill*, no. 7430 (CU, NY). Virginia: sandy and peaty border of Cat Pond south of Benns Church, Isle of Wight Co., *Fernald & Long*, no. 7357 (G, type; P, isotype); deep peat and mud, southeastern shore of Lake Drummond, Great Dismal Swamp, west of Wallaceton. Norfolk Co., *Fernald & Long*, no. 13570 (G). North Carolina: pineland, Sampson Co., *Blomquist*, no. 5657 (D); 4 miles north of Beaufort, Carteret Co., July 18, 1939, *Engels* (NC); savanna, 8 miles southwest of Jacksonville, Onslow Co., *Godfrey*, no. 6469 (G, NC); Pender Co., *Hyams*, no. 4979 (NY); edge of pocosin, 15 miles north of White Lake, Bladen Co., *Blomquist*, no. 10874 (CU, D); dried-out road-making sand-pit, 4 miles east of Bolton, Columbus Co., *Wiegand & Manning*, no. 581 (G); Southport, Brunswick Co., Aug. 13, 1930, *Blomquist* (G, P as no. 5648). South Carolina: shrub-bog, 3 miles east of Georgetown, Georgetown Co., *Godfrey & Tryon*, no. 774 (G); sandy drainage ditch, west of Salters, Williamsburg Co., *Godfrey & Tryon*, no. 514 (G, NY); marshy border of lake, 8 miles southeast of Columbia, Lexington Co., *Godfrey & Tryon*, no. 1339 (G, NY). Florida: swamps, Sanford, Orange Co., Nov. 3, 1927, *Rapp* (NY); prairie, Pinky-Villa, Kissimmee, Osceola Co., Oct. 1, 1938, *Singletary* (D).

4. R. glomerata (L.) Vahl. Caespitose: leaves flat, 2.5–5 mm. wide, linear-attenuate, carinate toward the apex with finely serrulate margins: culms triquetrous, smooth, ascending, 0.6–1.1

m. high, the upper ⅓–½ bearing the inflorescence, flexuous to arching: inflorescence composed of 3–6 narrow, flexuous, fasciculate cymes or large loose glomerules: spikelets ovoid, 4.5–6.5 mm. long, subsessile, ascending to spreading, 2–3-fruited (or if 1-fruited the spikelet terminated by a sterile floret): scales acute to obtuse, loosely imbricated except when the spikelet is 1-fruited, originally apiculate but usually soon erose, castaneous to dark brown: bristles 6, straplike; the margins retrorsely and heavily echinate; the tips connivent about the apex of the tubercle: achene 1.4 mm. wide, 1.5–1.7 mm. long; its body suborbicular, with definite shoulders, basally prolonged; surface glossy with pronounced pale umbo and heavy wirelike margin: tubercle compressed-subulate, 1.3–1.8 mm. long.

4a. Var. **typica.** Inflorescence composed of 4–6 narrow cymes, the small dense ultimate fascicles of which are borne on 3–4 slender approximate, ascending to arching branchlets which exceed one another so as to produce a continuous, wandlike effect: achene 1.2–1.4 mm. wide, 1.5–1.7 mm. long; gynophore of the achene thick and short: tubercle subulate, compressed; its base usually nearly covering the summit of the achene. PLATE 819, FIGS. 1A and 1B; MAP 2.—*R. glomerata* Vahl, Enum. ii. 234 (1806); Blake, RHODORA xx. 25, fig. 1 (1918); Fernald, RHODORA xxxvii. 401 (1935); Small, Man. 180 (1933). *Schoenus glomeratus* Linnaeus, Sp. Pl. i. 44 (1753). *R. paniculata* Gray, Ann. Lyc. N. Y. iii. 211, pl. 6, fig. 21 (1835), non Presl (1828). *R. glomerata* β *robustior* Kunth, Enum. ii. 296 (1837). *R. glomerata* var. *paniculata* (Gray) Chapman, Fl. So. U. S. 528 (1860); Britton, Trans. N. Y. Acad. Sci. xi. 88 (1892); Britton, Man. 185 (1901); Small, Fl. 195 (1903). Robinson & Fernald in Gray, Man. ed. 7: 201 (1908). *R. cymosa* Elliott, Sk. Bot. S. Car. and Ga. i. 58 (1816), non *Schoenus cymosus* Muhl. Cat., nomen nudum. *Phaeocephalum glomeratum* House, Am. Midland Nat. vi. 202 (1920). *Triodon glomeratus* [-*a*] Farwell, Rep. Mich. Acad. Sci. xv. 167 (1913).—Wet peaty or sandy soil, Delaware (one collection) and southeastern Virginia, southward along the Coastal Plain to northern Florida and west to eastern Texas; inland in the Appalachians of the Carolinas southward; scattered in Tennessee and northern Mississippi; fairly frequent along the drainage of the Arkansas, Red, and Sabine Rivers. The species is so definite that only representative specimens from western Louisiana and eastern Texas, where var. *typica* might be confused with the smaller var. *angusta*, are here cited. LOUISIANA: stream-bottom 6 miles south of Franklinton, Washington Parish, *Brown*, no. 6643 (La); open pineland, 1–2 miles north of Abita Springs, St. Tammany Parish, *Pennell*, no. 4133 (P); banks of Stoke Creek, 4 miles southeast of Harrisonburg, Catahoula Parish, *Brown*, no. 7383 (La); low wet soil along ditch, 1 mile south of Derry,

Natchitoches Parish, *Correll & Correll*, no. 9988 (D); Sodus, Sabine Parish, Sept. 1, 1883, *Letterman* (Mo); creek-bottom, 5 miles east of Ruston, Lincoln Parish, *Brown*, no. 6048 (La); margin of pond near Minden, Webster Parish, *Brown*, no. 5354 (La); meadow in pine hills near Mansfield, DeSoto Parish, *Brown*, no. 6093 (La); stream-bottom in long-leaf pine hills near Flatwoods, Rapides Parish, *Brown*, no. 6125 (La); in low prairies, Pointe aux Loups, Acadia Parish, Sept. 17, 1894, *Langlois* (CU); mixed pine-hardwoods west of Sulfur, Calcasieu Parish, *Brown, Nyland & Rogers*, no. 8593 (La). Texas: swamps east of Mineola, Wood Co., Aug. 13, 1902, *Reverchon* (Mo); 10 miles northeast of Gilmer, Upshur Co., *Cory*, no. 25659 (CU); swamps, Swan, Smith Co., Aug. 7, 1902, *Reverchon* (Mo); sandy bogs, Grapeland, Houston Co., *Palmer*, no. 14436 (Mo, US); ½ mile east of Keechi, Leon Co., *Cory*, no. 25256 (CU); near Huntsville, Walker Co., July, 1913, *Young* (Mo); Livingston, Polk Co., *Palmer*, no. 6781 (Mo); Orange, Orange Co., Aug. 8, 1880, *Letterman* (Mo); Houston, Harris Co., July 20, 1919, *Fisher*, no. 45 (US).

4b. Var. **angusta,** var. nov. Cymis 3–6, subglomeratis, remotis: achaenio 1–1.1 mm. lato, 1.5–1.6 mm. longo, subgloboso, basi angusto, attenuato: tuberculo anguste subulato, basi quam achaenii apice valde angustiore, 1.3–1.8 mm. longo.—Low prairie, Arkansas (one collection), western Louisiana, and eastern Texas. Arkansas: Grand Prairie, Pulaski Co., *Harvey*, no. 7 (G) and same locality, July, *Harvey in Redfield Herb.*, no. 15190 (Mo). Louisiana: ditch in Holloway Prairie, Holloway, Rapides Parish, June 24, 1936, *Brown*, no. 6442 (La); common, low prairie, vicinity of Lake Charles, Calcasieu Parish, Aug. 25, 1898, *Mackenzie*, no. 442 (Mo, NC, NY); Lake Charles, Calcasieu Parish, Aug. 7, 1897, *Tracy* (G, US); 1839, *ex herb. Torrey* (G). Texas: 21 miles north of Deweyville, Newton Co., Oct. 4, 1934, *Cory*, no. 10866 (G); 2.6 miles east of Camp Jackson, Hardin Co., Sept. 13, 1936, *Cory*, no. 19711 (CU, G); Cypress City, Harris Co., *Boll*, no. 886 (G); brook banks, Hempstead, Waller Co., June 10, 1872, *Hall*, no. 718 (G, type; Mo, US, isotypes).

R. glomerata var. *angusta* possesses in common with var. *typica* a several-flowered spikelet maturing 1–3 achenes and terminated by a rudimentary floret. Its habit, however, is generally more robust; the leaves are 3–5 mm. wide, and the ultimate fascicles are densely aggregated to glomerulose. It is, however, on a basis of the achene that the varietal distinction chiefly rests. That of *R. glomerata* var. *typica* is broadly ovoid with a short, thick gynophore. The achene of var. *angusta*, however, is, as the name implies, narrower, somewhat shorter,

with a slender accentuated gynophore as in *R. microcephala.* Both varieties have in common the heavy wirelike margin, the prominent pale umbo and straplike retrorsely echinate setae.

The geographic range of the new variety impinges upon that of var. *typica* in Arkansas and Louisiana, but continues westward into eastern Texas.

5. R. CAPITELLATA (Michx.) Vahl. Caespitose: leaves 1.5–3.5 mm. wide, flat, short, smooth, slightly carinate, becoming minutely serrulate on the upper margins: culms erect, slender, obtusely triangular, smooth, 1.9–9.2 dm. tall: the terminal cyme composed of 1–several ultimate, turbinate (rarely globose) fascicles on short included branchlets; lateral fascicles 1–5 on subincluded peduncles: spikelets ovoid, 3.4–5 mm. long, subsessile, 2–5-fruited (rarely 1-fruited and then terminated by a sterile floret): scales obtuse to acute, short-mucronulate, castaneous, swiftly caducous, often forced apart by the maturing achene: bristles 6, straplike, but weaker than those of *R. glomerata,* with retrorse barbules dwindling toward the base; tips convergent around the tubercle which they fail to equal or but slightly exceed: achene pyriform, 0.9–1.2 mm. wide, 1.3–1.8 mm. long, lenticular, plump, without a prominent umbo, edged by a narrow wirelike margin; the brown surface at maturity entirely or nearly uniform in coloring, smooth, lustrous: tubercle compressed-subulate, pale, 0.9–1.6 mm. long; its base widening nearly to cover the summit of the achene. PLATE 819, FIGS. 3A and 3B; MAP 1.—Enum. ii. 235 (1806); Blake, RHODORA, xx. 27 (1918); Small, Man. 180 (1933). *Schoenus capitellatus* Michaux, Fl. Bor.-Am. i. 36 (1803), in part. *R. capitellata* var. *minor* (Britt.) Blake, RHODORA, xx. 28, fig. 2 (1918). *R. capitellata* var. *leptocarpa* (Chapman) Blake, RHODORA, xx. 28, fig. 5 (1918). *R. glomerata* sensu Gray, Gram. et Cyp. i. no. 94 (1834) and Ann. Lyc. N. Y. iii. 217, pl. 6, fig. 29 (1835), and later authors up to 1918, non (L.) Vahl; Chapman, Fl. So. U. S.: 527 (1860); Britton, Man. 185 (1901); Robinson & Fernald in Gray, Man. ed. 7: 201, fig. 326 (1908); Victorin, Fl. Laurent. 689, fig. 248 (1935). *R. glomerata* var. *minor* Britton, Trans. N. Y. Acad. Sci. xi. 89 (1892); Britton, Man. 185 (1901); Fernald, RHODORA, xxxvii. 402 (1935). *R. glomerata* var. *leptocarpa* Chapman ex Britton, Trans. N. Y. Acad. Sci. xi. 88 (1892); Fernald, RHODORA, xxxvii. 401, 402 (1935). *R. leptocarpa* (Chapm.) Small, Man. 181, 1503 (1933). *Phaeocephalum glomeratum* var. *minus* Farwell, Rep. Mich. Acad. Sci. xxi. 361 (1920).—Common on lakeshores, river-banks and boggy places of southern Nova Scotia and New England (excepting northernmost Maine and Upper Vermont), thence southward on the Coastal Plain to North

Carolina; inland to the vicinity of the Great Lakes and along the Blue Ridge and Alleghanies from Maryland to Georgia; less common throughout western Tennessee and Missouri, with scattered stations in lower Georgia, northwestern Florida, Alabama, Mississippi, Arkansas, and eastern Texas; re-occurring in the coastal ranges of northern California and southern Oregon. The citation of specimens of this common, well-known species is limited to those from the extremities of its range. New Brunswick: ledges by Miramichi River, Northumberland Co., *Fernald & Weatherby*, no. 2408 (G); damp shores below Oakiok, York Co., *Brittain*, no. 11 (G). Maine: St. Francis, Aroostook Co., 1881, *Furbish* (NE). Carolina: 1794, Michaux Herb. (G, type-photo of *Schoenus capitellatus*). Georgia: low wet woods along small stream, near Thomasville, Thomas Co., *Correll*, no. 6484A (D); wet woods near Whigham, Decatur Co., *Harper*, no. 1185 (NY, US); in the canyon at Tallulah Falls, Rabun Co., alt. 1600 ft., Aug. 3, 1893, *Small* (NY); densely shaded sphagnum pockets in a swamp, Sylvester, Worth Co., *Svenson*, no. 6928 (G). Florida: Quincy, Gadsden Co. (G, no collector designated but handwriting that of John Carey); swamp near De Funiak Springs, Walton Co., *Curtiss*, no. 5926 (G, NC, NY). Alabama: moist sandy soil, DeSoto Falls, Jefferson Co., *Ruth*, no. 127 (NY). Ontario: marshy places, Moon River, Muskoka, July 1882, *Burgess* (G); au bord d'un petit lac, Timagami Park, *Victorin, Germain & Meilleur*, no. 45386 (G); Sandwich, *Macoun*, no. 25338 (G, NY, US). Kentucky: near Harlan Court House, Harlan Co., *Kearney*, no. 24 (G); wet flats of Red River, Logan Co., Aug. 1, (?), *Short* (P); wet flat on Ky. 98, Marshall Co., *Braun*, no. 4173 (G). Tennessee: gravelly oak woods, 6 miles east of Crossville, Cumberland Co., *Svenson*, no. 4171 (G, P); wet roadside depression, Jamestown, Fentress Co., *Svenson*, no. 4104 (G); bog, South Indian Creek, Unicoi Co., *Price*, no. 980 (D); low ponds at Thompson's, Williamson Co., *Ruth*, no. 713 (NC, NY); dry oak woods, Lawrenceburg, Lawrence Co., *Svenson*, no. 4298 (G); along road in swamp, about 1.5 miles southeast of Hollow Rock Junction, Carroll Co., *Svenson*, no. 425 (G, US); ditches, Henderson, Chester Co., *Bain*, no. 245 (G). Mississippi: Saratoga, Simpson Co., *Tracy*, no. 8616 (G, NY). Wisconsin: damp sandy shore of Crooked Lake, Siren, Burnett Co., *Fassett*, no. 7457 (G, f. *discutiens*); moist meadow, Marquette, Green Lake Co., *Hotchkiss & Martin*, no. 4407 (US); Arena, Iowa Co., July 27, 1922, *Davis* (G, f. *discutiens*). Arkansas: Benton Co., *Plank* (Mo; NY, no. 5); Fayetteville, 1879, *Harvey* (G). Louisiana: New Orleans, *Ingalls* (NY, designated as *R. glomerata* in Gray's handwriting and cited as such by Gray). Oklahoma: wet open ground, Antlers, Pushtamaha Co., *Palmer*, no. 9004 (CA, Mo, P). Texas: Swan, Smith Co., *Reverchon*, no.

2917 (Mo). CALIFORNIA: near Trinity Center, Trinity Co., *Howell*, no. 12845 (CA, G); Pitkin Marsh, 5 miles north of Sebastopol, Sonoma Co., *Howell*, no. 12677 (CA, in part f. *discutiens;* G, entirely f. *discutiens*). OREGON: sphagnum bog, Brookings, Curry Co., *Peck*, no. 8793 (NY).

In a recent paper Pfeiffer[1] appropriates the name *R. capitellata* (Michx.) Vahl for the common tropical and subtropical species of the Western Hemisphere which has heretofore been known as *R. glauca* Vahl. Since the name-bringing synonym, *Schoenus capitellatus* Michx., has been generally listed by American botanists, following the precedent of Torrey and Gray, in the synonymy of a widely spread and common species of the Series *Albae*, it is necessary to review the available information concerning the authentic material of *S. capitellatus* in the Michaux Herbarium.

According to notes made by M. Gadaceau of the Paris Herbarium and quoted by Blake[2] in 1918, the Michaux Herbarium contains two sheets with the label, *Schoenus capitellatus.* On one of these are mounted specimens of *R. Grayii* Kunth (*R. Elliottii* Gray non Dietr.) and of the species mentioned above as belonging to the Series *Albae.* The Gray Herbarium has a photograph of this sheet, and the two specimens of *R. Grayii*, designated as A and B, can be plainly seen, one on either side of the centrally placed subcapitate plant with inflorescence labeled C. The original label with the name, "*Schoenus capitellatus*" and the data "Hab. in Carolina" is affixed to the righthand side of the sheet and two slips of paper bearing Gray's annotations "*R. Elliottii* Gray" and "*R. glomerata*" (the name wrongly applied by Gray and later botanists up to 1918 to the species here recognized as *R. capitellata* (Michx.) Vahl) are mounted in the opposite corner. Of the second sheet M. Gadaceau writes, "L'autre offre quatre beaux echantillons du *R. glauca* Vahl." He then continues with remarks on the various Michaux specimens from the Richard Herbarium. To this herbarium belongs a sheet of *Schoenus capitellatus*, as labeled by Michaux, which has been referred by A. Richard to *R. glauca* Vahl.

Pfeiffer apparently has not seen either the paper by Blake or the decisive specimens in the Michaux Herbarium; for neither are

[1] Fedde, Rep. Spec. Nov. xlix. 75 (1940).
[2] RHODORA, xx. 26 (1918).

mentioned in his article. He does state, however, that authors prior to Boeckeler (especially Kunth) were cognizant of the relationship of *Schoenus capitellatus* to *R. glauca.* This statement, although incorrect in so far as it includes Torrey and Gray, both of whom identified *S. capitellatus* with plant C mentioned above, does indicate the probable source of Pfeiffer's synonymy. He is apparently only taking over the synonymy of *R. glauca* as given by the older European botanists and interpreting it in the light of the present International Rules of Nomenclature. Such an explanation also accounts for Pfeiffer's inclusion of the basonym, *Schoenus fascicularis* Michx., of another well-known American species, *R. fascicularis* (Michx.) Vahl, in the synonymy of *R. capitellata;* for it is so placed by Kunth[1]. Undoubtedly the treatment by the earlier European botanists of *R. glauca* as a synonym of *R. capitellata* was the result of the inclusion of the specimens which were later identified as *R. glauca* Vahl under the name of *Schoenus capitellatus* in the Michaux Herbarium. However, viewed in conjunction with the original description of *S. capitellatus* in Michaux's Flora Boreali-Americana[2], there can be within the mixture of *R. Grayii* Kunth, *R. glauca* Vahl (?) and plant C of the Series *Albae* only one possible correct application of the name *Schoenus capitellatus;* for Michaux states that the specimen under consideration has "Capitula breviter pedunculata, interdum geminata: semen compresso-obovatum" and "setulae retrorsum muricatulae." The habitat he gives as Carolina. Of the three species mentioned above *R. glauca* is eliminated at once by its range; for it is unknown in the United States. Nor does it have retrorsely barbed bristles. It is possible that the specimens of *R. Grayii* had a part in the more generalized portions of Michaux's descriptions, but that they could not have been of sole consideration is evidenced in the portions of the description quoted above. The peduncles of the axillary "capitula" of *R. Grayii* are exserted and attenuated, the achene is conspicuously swollen above, and, as in *R. glauca,* the bristles are upwardly hispidulous. Following the precedent established by Blake, I am, therefore, applying the name *R. capitellata* (Michx.) Vahl to the species

[1] Enum. ii. 297 (1837).
[2] Fl. Bor.-Am. i. 36 (1803).

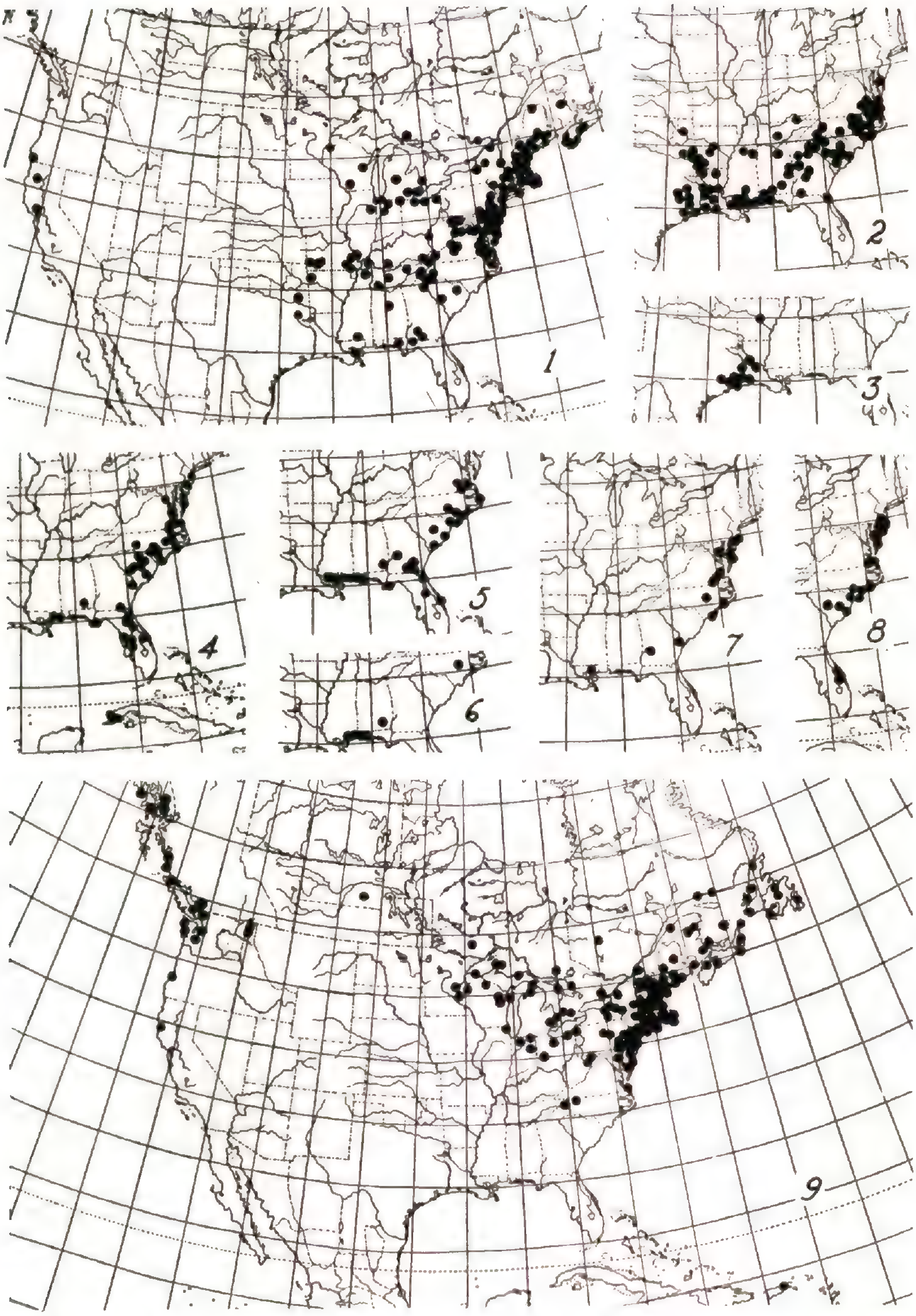
aforementioned as of the Series *Albae* which is typified by specimen C of the sheets labeled *Schoenus capitellatus* in the Michaux Herbarium.

Forma **controversa** (Blake), comb. nov. Bristles antrorsely serrulate.—Var. *controversa* Blake, Rhodora, xx. 28, fig. 3 (1918). *R. glomerata* var. *minor* f. *controversa* (Blake) Fernald, Rhodora, xxxvii. 402 (1935). *R. Smallii* Britton ex Small, Fl. 1321, 1327 (1903) and Man. 182 (1933).—Occurs infrequently throughout the range of the typical *R. capitellata*, with the exception of the southern states.

Forma **discutiens** (Clarke), comb. nov. Bristles smooth.—*R. glomerata* var. *discutiens* Clarke ex Britton, Trans. N. Y. Acad. Sci. xi. 89 (1892); Britton, Man. 185 (1901); Small, Fl. 195 (1903); Robinson & Fernald in Gray, Man. ed. 7: 201 (1908). *R. capitellata* var. *discutiens* (Clarke) Blake, Rhodora, xx. 28, fig. 4 (1918). *R. glomerata* var. *minor* f. *discutiens* (Clarke) Fernald, Rhodora, xxxvii. 402 (1935).—Occurs sporadically throughout the range of the typical *R. capitellata* with the exception of the southern states.

In 1933 Britton elevated the specimens of *R. capitellata* with antrorsely barbed bristles to specific rank under the name, *R. Smallii.* However, the antrorsely barbed phase of *R. cephalantha,* which has been generally known since the publication of Asa Gray's Monograph in 1835, has never received nomenclatorial recognition. Smooth-bristled specimens have been found in *R. capitellata* and *R. capillacea,* and have been generally treated as varieties. The first has its var. *discutiens,* made by Clarke in 1892 under *R. glomerata,* and transferred by Blake in 1918 to *R. capitellata*; the second, its var. *leviseta* E. J. Hill, 1876.

In 1935, with a view toward establishing uniformity in the treatment of these similar cases, Fernald discussed the significance of both the variation in direction, and the failure altogether, of barbing in the bristles. He points out that in *R. capillacea* the smooth-bristled state occurs sporadically throughout the wide range of that species. In *R. capitellata* (*glomerata* var. *minor*), as in *Eleocharis* and *Scirpus,* plants from the same locality have retrorsely or antrorsely barbed or even smooth bristles. Consequently he concludes that the atypical specimens are most adequately and satisfactorily covered as forms. I am accepting *R. capillacea,* f. *leviseta* (Hill) Fernald and following his precedent as to category in making the new combinations for



Range of 1, Rhynchospora capitellata; 2, R. glomerata, var. typica; 3, R. glomerata, var. angusta; 4, R. microcephala; 5, R. cephalantha, var. pleiocephala; 6, R. cephalantha, var. attenuata; 7, R. cephalantha, var. typica; 8, R. chalarocephala; 9, R. alba

both f. *discutiens* and f. *controversa* under *R. capitellata*. *R. cephalantha* var. *typica* f. *antrorsa* and var. *pleiocephala* f. *controversa* bring into line the hitherto neglected phases of that species.

6. R. ALBA (L.) Vahl. Caespitose, often densely so: leaves slenderly linear, 0.5–2.5 mm. wide, flat, becoming slightly carinate and then obscurely setaceous on keel and margins: culms slender, erect, triquetrous, 0.7–7 dm. high: fascicles 1–3, turbinate, 0.7–1.6 cm. wide; the smaller lateral fascicles exserted on slender, erect peduncles: spikelets ovoid, 3.5–5 mm. long, 2– (rarely) 3-flowered, often maturing 2 achenes, but if 1-fruited the spikelet terminated by an immature floret: fertile scales characteristically whitish to pale rufous, mucronate: bristles 10–12, stiffly connivent, obviously arranged in 2 series on the elongated stipe, retrorsely barbed, sparingly villous at the base, falling short of to exceeding the tubercle: achene pyriform, lenticular, biconvex, obscurely margined, with a prominent pale disc, irregularly lined, then generally darker toward the margins and faintly rugulose, 0.9–1.2 mm. wide, 1.6–1.8 (rarely–2) mm. long: tubercle attenuate-subulate, compressed, 0.6–1.2 mm. long; the narrow base not equalling the breadth of the summit of the achene. PLATE 819, FIGS. 4A and 4B; MAP 9.—Enum. ii. 236 (1806); Elliott, Sk. Bot. S. Car. and Ga. i. 57 (1816); Gray, Gram. et Cyp. i. no. 92 (1834) and Ann. Lyc. N. Y. iii. 213, pl. 6, fig. 24 (1835); Boeckeler, Linnaea, xxxvii. 570 (1873); Britton & Brown, Ill. Fl. i. 277, fig. 651 (1896), in part *R. macra* (Clarke) Small; Clarke in Urban, Symb. Ant. ii. 124 (1900); Britton, Man. 185 (1901), *R. macra* (Britt.) Small as to specimens from Florida; Robinson & Fernald in Gray, Man. ed. 7: 200, fig. 323 (1908); Small, Fl. 194 (1903) and Man. 180 (1933); M. L. Green, List of Standard Species of Nom. Conserv. 9, no. 492 (1926), mimeographed; Victorin, Fl. Laurent. 689, fig. 248 (1935); Fernald, RHODORA, xliv. 371 (1942). *Schoenus albus* Linnaeus, Sp. Pl. i. 44 (1753); Fl. Danica ii. 5, pl. 320 (1766); Michaux, Fl. Bor.-Am. i. 34 (1803). *R. alba* var. *macra* sensu Robinson & Fernald in Gray, Man. ed. 7: 201 (1908), non Clarke. *R. luquillensis* Britton, Bull. Torr. Bot. Cl. l. 56 (1923); Britton & Wilson, Sci. Surv. Porto Rico and Virgin Isl. v. 103 (1923). *Triodon albus* Farwell, Rep. Mich. Acad. Sci. xix. 253 (1917). *Phaeocephalum album* House, Am. Midland Nat. vi. 201 (1920). *Dichromena alba* Macbride, Field Mus. Pub. Bot. iv. 166 (1929).—Common in open sphagnum bogs from Newfoundland to Maryland, rare in Virginia, southward only in scattered mountain bogs of West Virginia, North Carolina and Puerto Rico; inland to the area of the Great Lakes and Saskatchewan (one collection), reappearing to the west in northern Idaho and along the Pacific coast from

northern California to southern Alaska; also in northern Eurasia. The citation of specimens of this well known and clearly defined species is limited to those from the outlying portions of its range. Quebec: openings in marly Arbor Vitae swamp, mouth of Bonaventure River, Bonaventure Co., *Collins, Fernald & Pease*, no. 5819 (G); open peaty spots in larch swamp, Grindstone, Grindstone Island, *Fernald, Long, & St. John*, no. 7015 (G, P); dans les tourbières, Isle à la Proie, Archipel de Mingan, *Victorin*, no. 20225 (G); Father Point, *Williamson*, no. 1090 (P); in peat bogs, St. Hubert, Chambly Co., July, 1910, *Victorin* (US); tourbière flottante, 93 miles au nord de Mont-Laurier, route Mont-Laurier, Senneterre, *Marie-Victorin, Rolland-Germain & Blain*, no. 309 (G). Delaware: New Castle, New Castle Co., *Tatnall* (G); swamps near Laurel, Sussex Co., Aug. 19, 1880, *Commons* (P). Maryland: 4 miles north of Salisbury, Wicomico Co., *Shreve & Jones*, no. 1278 (US); peat bog, Glenburnie, Anne Arundel Co., Aug. 19, 1905, *Chrysler* (G); Suitland Bog, Prince George Co., *C. P. Smith*, no. 3192 (CA); open white gravel bog, Powder Mill Bogs, near Lewiston, Prince George Co., *Blake*, no. 10671 (G); sphagnous bog, northwest of Mountain Lake Park and vicinity, Garrett Co., on the Alleghany Plateau, alt. 720 m., *Steele*, no. 77 (US). Virginia: wooded swamp of North Landing River, west of Pungo Ferry, Princess Anne Co., *Fernald & Long*, no. 13899 (G). West Virginia: Aurora and vicinity, Preston Co., alt. about 3000 ft., Aug. 15–Sept., *Steele & Steele* (NY, US). North Carolina: roadside between Sparta and Roaring Gap, Alleghany Co., *Blomquist*, no. 5612 (D). Saskatchewan: bog, Dahlton, Aug. 9, 1936, *Breitung* (NY). Idaho: Priest Lake, Bonner Co., *Piper*, no. 3756 (G, US); Minard's Bay, Bonner Co., Priest Lake, alt. 660 m., *MacDougal*, no. 294 (NY). California: Inglenook Swamp, Mendocino Co., *Congdon*, no. 67092 (G, US). Oregon: *Hall*, no. 568 (G); bog near Florence, Roosevelt Highway, Lane Co., *Henderson*, no. 13978 (P). Washington: in quaking sphagnum bog, Fazon Lake, Whatcom Co., *Muenscher*, no. 10145 (G); in floating bogs in Samish Lake, Whatcom Co., *Suksdorf*, no. 1014 (G, NY, US); bogs, rare, Seattle, King Co., *Piper*, no. 1121 (G, NY); in sphagnum bog, 28 miles south of Tacoma on Mt. Rainier Road, Pierce Co., *Abrams*, no. 9232 (NY); Wreck Creek Prairie near Granville, Chehalis Co., *Howell*, no. 374 (NY, P, US); bog, edge of ditch, Onslow Station, N. P. RR., 20 miles northwest of Hoquiam, Grays Harbor Co., *Foster*, no. 870 (US); bogs, Moclips, Grays Harbor Co., *Cowles*, no. 619 (G, Mo); in damp meadows of Baker Prairies, Grays Harbor Co., *McGee*, no. 556 (CA). British Columbia: Fort Rupert, Vancouver Island, 1904, *Hunt* (NY); Vancouver, Aug. 28, 1893, *Macoun* (US); meadows, boggy and rocky, of northwest part of Calvert Island, south of Kwatshua, *McCabe*, no. 3083

(G); muskegs in sphagnum in wet places, borders of ponds, Smyth Island, Bardswell Group, *McCabe*, no. 3184 (G). ALASKA: sphagnum bog, Wrangell, *Walker & Walker*, no. 728 (G); Sanitarium, *Anderson*, no. 290 (US, immature); bog, Ketchikan, *Cowles*, no. 1408 (US); vicinity of Loring, summer, 1903, *Chamberlain* (US, immature); in marshes near Yes Bay, *Howell*, no. 1683 (NY, US, immature); upland meadows, Back Bay, *Gorman*, no. 122 (NY, US, immature); marshy margin of lake, Prince of Wales Island, *Walker & Walker*, no. 904 (CU, G, NY, US). PUERTO RICO: rocks, summit of El Yunque, alt. 1050 m., *Gleason & Cook*, no. X-86 (NY) and *Britton & Bruner*, no. 7626 (NY); Sierra Luquillo, *Hioram*, no. 364 (NY, TYPE of *R. luquillensis;* US, ISOTYPE).

Britton's *R. luquillensis* from the eastern mountains of Puerto Rico is morphologically inseparable from phases of *R. alba.* In general appearance it closely resembles the short, thickly caespitose specimens of *R. alba* collected on the Newfoundland tablelands. *Gleason & Cook*, no. X-86 is especially similar to *Fernald & Wiegand*, no. 2753. Also the spikelets of the Puerto Rican material, like those of the continental *R. alba,* are 1–3-fruited and usually (if 1-fruited, invariably) terminated by a sterile floret; and the achenes are identical with those of *R. alba* in all particulars.

Pfeiffer[1] has published *R. alba* var. *meridianus,* based on specimens collected by Lützelburg in northeastern Brazil. He states in the description that the bristles are 6–8, which seems to indicate that his plants vary, at least in this respect, from the typical. Unfortunately, I have not seen any of his material, for it would be interesting to compare it with the specimens from Puerto Rico.

Forma **laeviseta,** f. nov. Setis praeter basem sparse plumosam laevibus.—Occurs commonly with the typical form in Newfoundland; less commonly in eastern Quebec and Nova Scotia; infrequent in Pennsylvania, the vicinity of the Great Lakes and British Columbia. NEWFOUNDLAND: wet depressions and borders of rills on peaty slopes, Great Barachois (or Barasway Bay), District of Burgeo and La Poile, Sept. 11, 1926, *Fernald, Long & Fogg*, no. 119 (G); bare spots on peaty and gravelly slopes, French (or Tweed) Island, Bay of Islands, Sept. 2, 1926, *Fernald, Long & Fogg*, no. 118 (G, TYPE); wet bog-barrens, Trepassey, Avalon Peninsula, Aug. 16, 1924, *Fernald, Long & Dunbar*, no. 26344 (G); shallow pond-holes in tundra west of

[1] Fedde, Rep. Spec. Nov. xxxiii. 210 (1933).

Rushy Pond, Valley of Exploits River, Aug. 28, 1911, *Fernald & Wiegand*, no. 4718 (G); heath on diorite tableland, Lookout Mt., Bonne Bay, alt. about 380 m., Aug. 26, 1910, *Fernald & Wiegand*, no. 2753 (G); marsh west of Force le Plain pool, Harry's Brook, Aug. 9, 1929, *R. B. Kennedy*, no. 71072 (G); patches of damp peat with Utricularia, Middle Ridge, July 26, 1937, *Moir*, no. 41 (G). Miquelon: maricages, tourbière près du pont de Miquelon, July 31, 1901, *Arsène*, no. 98 (G). Quebec: dans la grande tourbière, Saint Charles de Bellechasse, Aug. 11, 1925, *Rousseau*, no. 20224 (G); sphagnum swamp, Natashquan, Saguenay Co., Sept. 4, 1915, *St. John*, no. 90201 (G). Nova Scotia: sphagnous pockets in sandy plains, Middleton, Annapolis Co., July 20, 1920, *Bean & White*, no. 20267 (G). Pennsylvania: vicinity of Allentown, Lehigh Co., *Pretz*, no. 7793 (P); open (calcareous) marshy meadow, vicinity of Allentown, Lehigh Co., *Pretz*, no. 10361 (P). Wisconsin: Oneida Reservation, July 12, 1881, *Schuette* (G). British Columbia: Lulu Island, Aug. 11, 1938, *Eastham* (NY).

7. R. macra (Clarke) Small. Caespitose: leaves 1.5–3.5 mm. wide, flat, ascending; upper margins serrulate: culms erect, slender, acutely trigonous, 3.9–7.2 dm. high: terminal fascicle turbinate to corymbiform, 1.3–3 cm. wide; 1–2 lateral fascicles smaller, on slender exserted peduncles: spikelets ovoid, 4–5 mm. long, invariably 1-flowered, with the achene terminating the axis: scales mucronulate, rusty: bristles 18–20, obviously arranged in at least two series, connivent, exceeding the tubercle; the barbs of the distal portion retrorse, reversing their direction in the proximal half, and lengthened into a few hairs at the base: achene pyriform, lenticular, 1.3–1.4 mm. wide, 2–2.1 mm. long; the base somewhat attenuate as in *R. alba;* the surface obscurely rugulose, pale over the umbonal region, irregularly lined, then generally darkened toward the margins: tubercle narrowly subulate, compressed, 1 mm. long; the base not including the summit of the achene. Plate 820, figs. 3A and 3B; Map 12.—Man. 180 (1933). *R. alba* var. *macra* Clarke ex Britton, Trans. N. Y. Acad. Sci. xi. 88 (1892); Small, Fl. 194 (1903). *R. alba* sensu Chapman, Fl. So. U. S. 527 (1860), in part, non Vahl. *Triodon albus* Farwell, var. *macer* Farwell, Rep. Mich. Acad. Sci. xix. 253 (1917). *Phaeocephalum album* House var. *macrum* Farwell, Rep. Mich. Acad. Sci. xxi. 361 (1920).—Bogs of Coastal Plain from Georgia west to eastern Texas. Georgia: wet sloping bog, Coffee Co., *Harper*, no. 716 (G, NY). Florida: Liberty Co., Aug. 1886, *Curtiss* (US); wet springy places, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 861a (G, US); "*Rhyn. alba* with many bristles," *Chapman* (G). Mississippi: Biloxi, Harrison Co., *Tracy*, no. 4886 (NY, US); Mississippi City, Harrison Co., *Lloyd & Tracy*, no. 380 (NY).

TEXAS: sandy bogs, Grapeland, Houston Co., *Palmer*, no. 14404 (Mo) and no. 12844 (Mo); 2 miles south of Grapeland, Houston Co., *Cory*, no. 26080 (CU); *Drummond*, no. 281 (NY, ISOTYPE, immature).

This species, known only from Georgia, Florida, Mississippi and Texas,[1] was set off from *R. alba* Vahl by Clarke. He described it as having "clusters larger, sometimes 3 mm. broad, bristles more numerous 15–20." In 1933 Small elevated *R. alba* var. *macra* Clarke to specific rank without adding anything of note to the original description. On examination, however, the spikelets of *R. macra* prove to differ from those of *R. alba* in several characters. In the former species each spikelet is invariably 1-flowered so that the single maturing achene terminates the axis. In *R. alba*, on the contrary, each spikelet is 2- (more rarely) 3-flowered. Commonly two achenes mature, the uppermost of which may or may not terminate the axis, depending upon the presence or absence of a third almost invariably sterile floret. If the spikelet is 1-fruited, however, the achene is always succeeded by a sterile floret. It is the presence in *R. macra* of a consistently 1-flowered spikelet, coupled with its generally grosser habit, its increased number of bristles, and larger achene that leads me to agree with Small in thinking it to be a good species.

8. R. KNIESKERNII Carey. Caespitose: leaves filiform-setaceous to 1.8 mm. wide, involute when dry, smooth, becoming serrulate on margins and keel: culm slender to filiform, flexuous, 1.5–5 dm. high: terminal fascicle 0.4–1 cm. wide; 2–3 lateral fascicles remote at intervals along the entire length of the culm, with peduncles included: spikelets ovoid, 2–2.8 mm. long, subsessile, 2–3-fruited, terminated by a sterile floret: scales caducous, castaneous to dark brown; lower scales apiculate, upper ones slightly so: bristles 6, stiffly erect, retrorsely barbellate, falling short of to barely exceeding the body of the achene: achene obovoid, 0.6–0.8 mm. wide, 1.1–1.3 mm. long, lenticular, biconvex, nearly imperceptibly rugulose, a shining yellow-brown in the center, becoming fragmentarily lined, then generally darker toward the margins: tubercle deltoid-subulate, compressed, 0.4–0.6 mm. high. PLATE 819, FIGS. 2A and 2B; MAP 11.—Am. Journ. Sci. Ser. 2: iv. 25 (1847); Gray, Man. 533 (1848); Britton & Brown, Ill. Fl. i. 278, fig. 653 (1896); Britton, Man. 185 (1901); Robinson & Fernald in Gray, Man. ed. 7: 201, fig. 325 (1908). *R. Grayana* Knieskern ex Carey, Am. Journ.

[1] **Reports of *R. macra* from New England are erroneous, being founded on specimens of *R. alba* exhibiting gigantism.**

Sci. Ser. 2: iv. 25 (1847), *as synonym*, non *R. Grayii* Kunth. *Phaeocephalum Knieskernii* (misspelled *Kneiskernii*) House, Am. Midland Nat. vi. 202 (1920).—Moist places in pine barrens of New Jersey and Delaware. New Jersey: Point Hollow, 1843, *Knieskern* (NY, type, annotated by Carey); pine woods, Shark River, Monmouth Co., *Mackenzie*, no. 8003 (NY, P); (on bog iron ore?) sandy bogs southeast of Bombat, Ocean Co., Aug. 25, 1909, *Long* (G, P); dominant on iron ore banks near Atsion, Burlington Co., Aug. 26, 1867, *Parker*, (G, P); moist humus, Parkdale, Camden Co., *Pennell*, no. 9030 (NY); pinelands, Egg Harbor City, Atlantic Co., *Mackenzie*, no. 8050 (NY). Delaware: swamps, Baltimore Hundred, Sussex Co., Sept. 10, 1875, *Commons* (P); swamp, near Gumboro, Sussex Co., Aug. 5, 1874, *Commons* (P).

First distributed under the herbarium-name, *R. Grayana* Knieskern, this rare little species of the New Jersey and Delaware pine barrens was later described and published by Carey in 1847 as *R. Knieskernii*, the change in name being made because of *R. Grayii* of Kunth, 1839.

9. R. capillacea Torr. Caespitose: leaves filiform-setaceous, involute, at least on drying, becoming slightly carinate then serrulate on keel and margins: culms flexuous-erect, capillary, 0.9–4 dm. high: fascicles ovoid, erect with 1–10-spikelets, 3–8 mm. wide; the single lateral fascicle remote on a subincluded peduncle: spikelets lanceolate to fusiform, 5–6 mm. long, erect, sessile or nearly so, 1–5-fruited: fertile scales castaneous to dark brown with the prominent midrib prolonged into a short mucro: bristles 6, erect to ascending, retrorsely barbellate, falling short of to exceeding the tubercle: achene 0.8–1 mm. wide, 1.8–2 mm. long, oblong-elliptic, lenticular, with a very narrow gynophore, obscurely rugulose, the central region pale, irregularly lined, then generally darkened toward the margins: tubercle compressed, attenuate-subulate, 0.8–1.6 mm. tall. Plate 818, figs. 2A and 2B; Map 10.—Fl. N. and Mid. St. i. 55 (1823) and Ann. Lyc. N. Y. iii. 366 (1836); Gray, Gram. et Cyp. i. no. 95 (1834) and Ann. Lyc. N. Y. iii. 214, pl. 6, fig. 25 (1835) and Man. 533 (1848); Britton & Brown, Ill. Fl. i. 278, fig. 652 (1896); Britton, Man. 185 (1901); Robinson & Fernald in Gray, Man. ed 7: 201, fig. 324 (1908). *R. setacea* (Muhl.) MacMillan, Metasp. Minn. Valley, 104 (1892), non Vahl. *Schoenus setaceus* Muhlenberg, Descrip. Gram. 6 (1817), non Vahl. *Triodon capillaceus* [*a*] Farwell, Rep. Mich. Acad. Sci. xv. 167 (1913). *Phaeocephalum capillaceum* Farwell, Rep. Mich. Acad. Sci. xxi. 361 (1920).—Sporadic in marly bogs and on calcareous ledges from the western coast of Newfoundland through southern Pennsyl-

vania; more common inland in the region of the Great Lakes (excepting Lake Superior), south through Ohio, with scattered stations in western Virginia, Tennessee, northern Iowa, northern North Dakota, and Saskatchewan, and a concentration in southeastern Missouri. Cited specimens of this clear-cut species are limited to those from the extremities of the range. NEWFOUNDLAND: in bogs, Bonne Bay, July 26, 1930, *Jansson* (G, f. *leviseta*); Harry's Brook near Dump Pool, *R. B. Kennedy*, no. 920 (G, f. *leviseta*). QUEBEC: open spots, marly Arbor Vitae swamps, mouth of Bonaventure River, Bonaventure Co., *Collins, Fernald & Pease*, no.4774 (G). NEW BRUNSWICK: crevices of wet calcareous ledges, Gorge of Aroostook River, Victoria Co., *Robinson & Fernald* in Pl. Exsic. Gray., no. 44 (CA, CU, G, NE, NY, P, US). MAINE: calcareous ledges, Ft. Fairfield (above mouth of Aroostook River), Aroostook Co., July 11, 1893, *Fernald* (NE); ledgy river bank, Winslow, Kennebec Co., *Fernald*, no. 2785 (NE, f. *leviseta*). VERMONT: 4th of July Slide, Mt. Willoughby, Orleans Co., Aug. 15, 1896, *Faxon* (NE, NY, US). CONNECTICUT: border of pond, Salisbury, Aug. 28, 1910, *Phelps* (G, NE). NEW YORK: Watertown, Jefferson Co., 1834, *Gray* (NY, cited by Gray). NEW JERSEY: limestone sink, White Pond, Sussex Co., *Mackenzie*, no. 4766 (NY); marl beach, White Pond, Warren Co., *Griscom*, no. 12120 (G). PENNSYLVANIA: one mile east of Johnsonville, Northampton Co., Sept. 2, 1907, *Van Pelt* (G, P); in limestone, Dillerville Swamp, Lancaster Co., July 16, 1901, *Heller* (G; US, no. 4839). VIRGINIA: boggy meadow fed by springs in limestone area, vicinity of Watauga, Washington Co., *Carr*, no. 585 (Penn.) OHIO: cedar swamp, Champaign Co., *Werner*, no. 170½ (NY); rather abundant in bog, Cedar Swamp, vicinity of Tremont City, Clark Co., *Leonard*, no. 2090 (US); Paxton, Ross Co., Aug. 1933, *Pontius & Bartley* (US). TENNESSEE: dolomitic limestone, Cedar Creek, Campbell Co., *Underwood*, no. 163 (CU). IOWA: bog, Estherville, Emmet Co., *Walden*, no. 1113 (G); marshy zone around springs emerging from a knoll 5 miles east of Ruthven south of the viaduct over Highway 18, Highland, Palo Alto Co., *A. Hayden*, no. 742 (G, P); abundant, forming a zone around a hanging bog, southwest of Silver Lake, Silver Lake, Dickinson Co., *A. Hayden*, no. 10886 (P); marshy plain in a hanging bog, Logan, Clay Co., *A. Hayden*, no. 8040 (NY). NORTH DAKOTA: Turtle Mts., Bottineau, Bottineau Co., alt. 2000 ft. July 25, 1896, *Barber* (US). SASKATCHEWAN: bog, rare, 4 miles southwest of Wallwort, *Breitung*, no. 1373 (G).

Forma LEVISETA (E. J. Hill) Fernald. Bristles smooth, otherwise identical with *R. capillacea*.[1]—RHODORA, xxxvii. 252 (1935).

[1] For discussion see treatment of *R. capitellata* f. *discutiens*.

Var. *leviseta* E. J. Hill ex Gray, Am. Nat. x. 370 (1876); Britton & Brown, Ill. Fl. 278 (1896); Britton, Man. 185 (1901); Robinson & Fernald in Gray, Man. ed. 7: 201 (1908). *Phaeocephalum capillaceum* var. *levisetum* Farwell, Rep. Mich. Acad. Sci. xxi. 361 (1920).—Occasional in the range of the typical form in Newfoundland, Maine and the area of the Great Lakes. With the exception of the type, representative specimens of f. *leviseta* have been cited with those of the typical form. INDIANA: wet pine barrens, Pine Station, head of Lake Michigan, July 28, 1875, *Hill* (G, TYPE of var. *leviseta*).

Asa Gray, in reporting var. *leviseta* for Hill, mentions another possible variety of *R. capillacea,* characterized by 12 setae and a short "stipe" which had been collected in Herkimer County, New York by J. A. Paine, 1864. The sheet in the Gray Herbarium labeled Litchfield, Hidden Lake, Herkimer County, New York, *John A. Paine,* 1864, is mixed. The two specimens with achenes bearing as many as 12 bristles are poorly developed *R. alba* (L.) Vahl.

Series 2. PLUMOSAE (Clarke) Small, emend. Plants of damp or exsiccated pine barrens on the Coastal Plain, the West Indies and Central America. Caespitose: leaves filiform to 3 mm. wide: culms capillary to slender: inflorescence reduced to a few spikelets or 1–2 spiciform or corymbiform fascicles: spikelets usually 1- (rarely 2–3)-fruited, pedicellate to sessile: scales castaneous to pale brown, tightly imbricated: bristles heavily plumose in at least their lower portions; tips antrorsely serrulate; rarely reduced to 6 plumose tufts: achene rugulose to ridged, emarginate, usually rotundly obovoid: tubercle conical.—Man. 175 (1933). *Rhynchospora,* Series B. *Diplostyleae,* Sect. 2, *Plumosae* Clarke in Urban, Symb. Ant. ii. 105 (1900), in part. *Rhynchospora* § *Eriochaete* Gray in Torr. Ann. Lyc. N. Y. iii. 363 (1836); Steud. Cyp. 139 (1855).

KEY TO SPECIES IN SERIES PLUMOSAE

Spikelets 1–5, remote on 1–2 slender branchlets, the lowermost of which is abruptly divergent .... 10. *R. oligantha.*
Spikelets numerous, congested in ovoid to spiciform fascicles.
  Fascicles ovoid to irregularly corymbose; achene 1.4–1.7 mm. wide, 2–2.2 mm. long; leaves 2–3 mm. wide ....11. *R. intermedia.*
  Fascicles spiciform; achene 1.1–1.4 mm. wide, 1.4–1.8 mm. long; leaves filiform to 1 mm. wide ....12. *R. plumosa.*

10. R. OLIGANTHA Gray. Densely caespitose: leaves filiform-setaceous, canaliculate, smooth, blunt-tipped, ascending: culms capillary, erect or often weak, leafless, 1.6–3.7 dm. tall: inflorescence reduced to 1–2 elongate capillary branchlets, the one erect and with 1–2-spikelets, the other abruptly divergent, with 1–3-

spikelets, subtended by a long filiform erect often circinately-tipped bract which appears as a continuation of the culm; rarely a single remote lateral spikelet present: spikelets ovate to lanceolate in outline, with 2–4 florets, 1–3-fruited, pale cinnamon-brown, 4–7 mm. long; scales ovate, sometimes mucronulate, tightly imbricate: bristles 6, partially plumose, slightly shorter than the achene to exceeding the tubercle or reduced to tufts: achene broadly elliptic or ovate, subterete, 1.6–2 mm. wide, 2–2.6 mm. long, horizontally rugulose with faint longitudinal striae: tubercle conical, 0.3–0.6 mm. in height.

10a. Var. **typica.** Bristles slightly shorter than the achene to exceeding the tubercle; the lower portion covered by dense, reddish, silvery-tipped hairs; the upper portion upwardly hispidulous: achene broadly elliptic, subterete, 1.6–2 mm. wide, 2.3–2.6 mm. long, occasionally having a trace of a bluish bloom over the castaneous to dark brown surface; the summit noticeably constricted under the wide basal flange of a conical-attenuate tubercle (0.4–0.6 mm. in height). PLATE 821, FIGS. 2A and 2B; MAP 15.—*R. oligantha* Gray, Ann. Lyc. N. Y. iii. 212, pl. 6, fig. 22 (1835); Chapman, Fl. So. U. S. 524 (1860), in part var. *breviseta* Gale; Gray, Man. ed. 6: 585 (1890); Britton & Brown, Ill. Fl. i. 277, fig. 650 (1896); Britton, Man. 184 (1901), var. *breviseta* as to specimens from Florida; Small, Fl. 194 (1903) and Man. 180 (1933); Robinson & Fernald in Gray, Man. ed. 7: 200, fig. 321 (1908).—Open bogs of the New Jersey Pine Barrens and Delaware; North Carolina, southern Georgia and westward along the coast to Mississippi and eastern Texas; also in Central America. NEW JERSEY: peaty savanna-bog along Mullica River southeast of Atsion, Burlington Co., *Long*, no. 50410 (G, P); open pine bogs, 2 miles southeast of Chatsworth, Burlington Co., *Mackenzie*, no. 6085 (D, G, NY). DELAWARE: in a sandy bog near Lewes, Sussex Co., Aug. 15, 1895, *Commons* (G, P). NORTH CAROLINA: *Schweinitz* (NY, TYPE); pine barrens, Fayetteville, Cumberland Co., *Schweinitz*, no. 7 (P; labeled "Schoenus rariflorus El."). GEORGIA: wet pine barrens, Sumter Co., *Harper*, no. 1027 (G, US); in moist pine barrens forming clumps of wire grass, Sylvester, Worth Co., *Svenson*, no. 7263 (G). FLORIDA: west Florida, *Chapman* (P). ALABAMA: about swamp, Elberta, Baldwin Co., Aug. 24, 1924, *Wolf* (StB); low sandy soil, Mobile, Mobile Co., May 1, 1940, *Sargent* (Sargent Herb.). TEXAS: swamps, Swan, Smith Co., *Reverchon*, no. 2919 (G, Mo, US); bogs, Hempstead, Waller Co., *Hall*, no. 715 (G, US); *Drummond*, no. 282 (G).

10b. Var. **breviseta,** var. nov. Setis plerumque ad 6 cristas villorum argenteorum reductis; saepe 1–2 prolongatis apicem versus serrulatis achaenio duplo brevioribus: achaenio ovoideo 1.6 mm. lato 2 mm. longo, caeruleo-pruinoso; tuberculo breviter

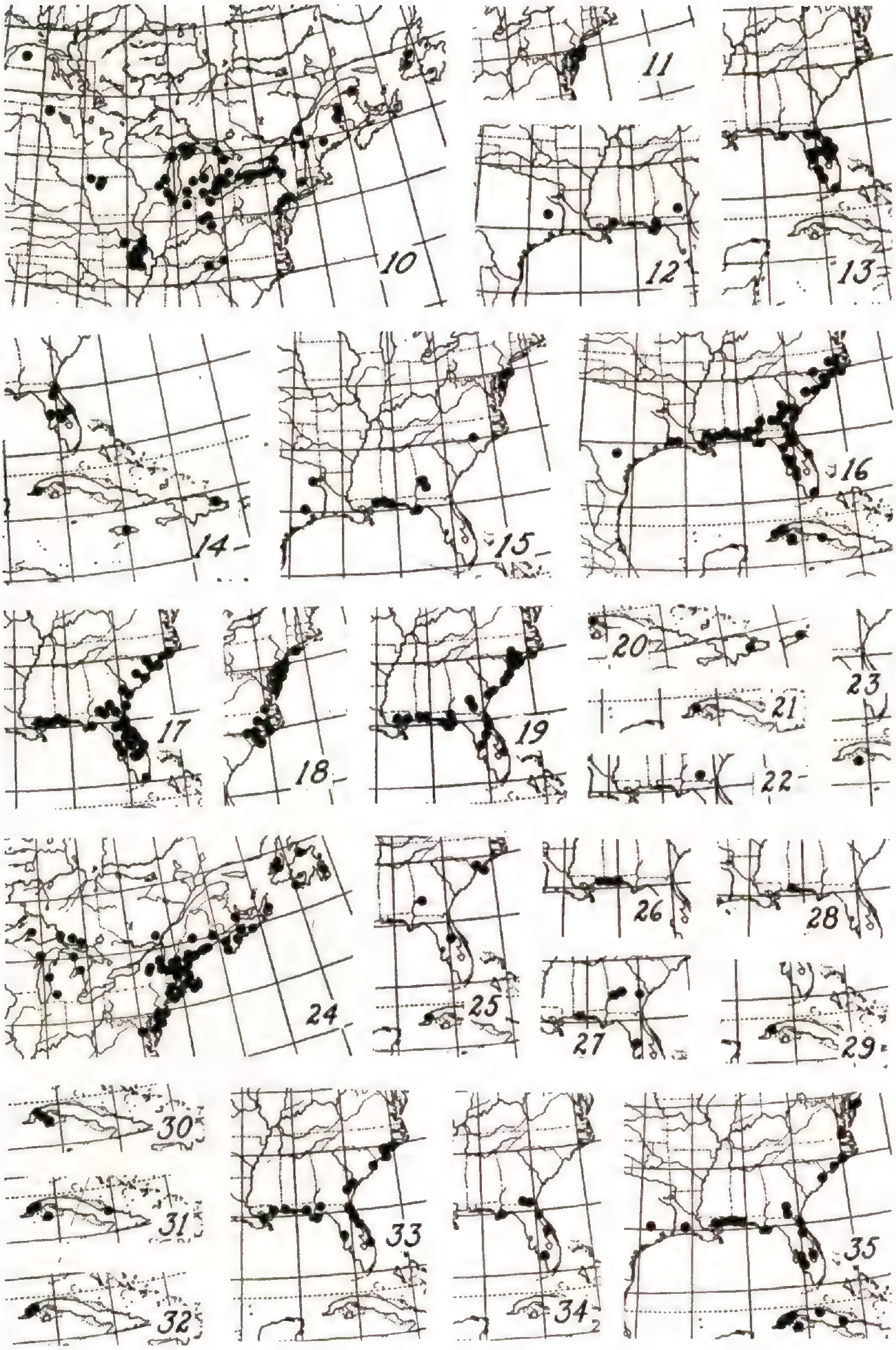
conico 0.3–0.4 mm. longo. Plate 821, fig. 2C; Map 14.—*R. oligantha* sensu Kükenthal, Fedde Rep. Spec. Nov. xxiii. 207 (1926) and xxxii. 76 (1933); non Gray.—Low areas in pine barrens and savannas, Florida Peninsula, western Cuba, Jamaica and Hispaniola. Florida: damp pine barren, Duval Co., *Fredholm*, no. 5179 (G); moist pine barrens near Jacksonville, Duval Co., June, *Curtiss*, no. 3165 (P, US); damp pine barrens near Jacksonville, Duval Co., June 19, 1896, *Curtiss*, no. 5687 (G, type; NC, US, isotypes); near Jacksonville, Duval Co., May 26, 1893, *Curtiss*, no. 4116 (US); low pine barrens, June, 1884, *Curtiss* (US); Winter Park, Orange Co., Apr. 1919, *Francis* (US); rather dry pine barrens about 1½ miles south of Starke, Bradford Co., May 13, 1909, *Harper*, no. 39 (US); cut-over flatwoods, west of Lake Reedy, Frostproof, Polk Co., May 7, 1931, *McFarlin*, no. 5138 (CU); Tampa, Hillsborough Co., May, 1876, *Garber* (G). Cuba: in slightly moist places (between Alcatrez Grande and Alc. Chico) at Laguna Restinga, Pinar del Rio, Nov. 18, 1923, *Ekman*, no. 18129 (NY, US); Laguna Restinga, between Palmarejo and Las Martinas, Pinar del Rio, Nov., 1923, *Ekman* (NY). Hispaniola: savanna in Rhexia association, not rare, El Valle, Sabana de la Mar, prov. de Samana, Cordillera Central, Santo Domingo, July 11, 1930, *Ekman*, no. 15652 (G, NY, US). Jamaica: in small patches amongst shrubs and grasses, Hollis's Savanna, Upper Clarendon, alt. 2400 ft., Jan. 12, 1915, *Harris*, no. 12249 (NY, US).

11. R. intermedia (Chapm.) Britt. Caespitose: leaves canaliculate, carinate, 2–3 mm. wide, margins mostly upwardly serrulate: culms terete, erect, slender, 2.5–6.7 dm. tall: fascicles 1, rarely 2, congested, irregularly corymbiform or broadly ovate in outline, 0.9–2.2 cm. wide; the lateral fascicle when present smaller and remote: spikelets ovoid, compact, sessile, with 1–2 florets, 1- (rarely 2-) fruited, 4.5–5.5 mm. long: fertile scales acute, castaneous: bristles 6, equalling or overtopping the tubercle, covered with long ascending silky white hairs which are diminished at the top to stiff upward serrulations: achene rotundly obovoid, transversely ridged to rugulose, evenly browned, 1.4–1.7 mm. wide, 2–2.2 mm. long: tubercle conical-apiculate, depressed, 0.6 mm. high. Plate 820, figs. 4A and 4B; Map 13.—Trans. N. Y. Acad. Sci. xi. 87 (1892), non Beyrich; Small, Fl. 194, 1327 (1903) and Man. 180 (1933). *R. plumosa* var. *intermedia* Chapman, Fl. So. U. S. 524 (1860). *R. pineticola* Clarke, Kew Bull. Add. Ser. viii. 40 (1908). *Phaeocephalum intermedium* House, Am. Midland Nat. vi. 202 (1920). Dry sandy pine barrens, peninsula of Florida. Florida: Hibernia, Clay Co., March, 1869, *Canby* (NY); Gainesville, Alachua Co., March, 1876, *Garber* (NY); dry pine barrens, Mosquito Inlet, Volusia Co., *Curtiss*, no. 3173 (CA, G, NC, NY, P, US); Lake Butler, Orange Co., *Beckwith*, no. 558 (US); Eustis, Lake

Co., *Nash*, no. 2020 (G, NY, P, US); dry pine barrens, Eau Gallie, Indian River, Brevard Co., *Curtiss*, no. 5703 (D, G, NY, US); hammock near St. Cloud, Osceola Co., *Small, DeWinkler & Mosier*, no. 11166 (NY); Tampa, Hillsborough Co., *Britton & Wilson*, no. 20 (NY); flatwoods, Lee Co., *Hitchcock*, no. 427 (G, NY, US); Palma Sola, Manatee Co., *Tracy*, no. 6998 (G, NY, US); Miami, Dade Co., June, 1877, *Garber* (G, P, US); dry sandy ridges near coast, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 4481 (G, NY, US).

R. intermedia can be arbitrarily distinguished from *R. plumosa* on a basis of size. Its leaves are wider, the spikelets larger, and the achene 2–2.2 mm. long in contrast to 1.6–1.8 mm. long for that of *R. plumosa.* There is a pronounced tendency also for the fascicles of *R. intermedia* to be irregularly globose rather than elongated-spiciform.

12. R. plumosa Ell. Caespitose: leaves filiform to 1 mm. wide, canaliculate, becoming subtriquetrous and scabrous toward the apex, ascending or sometimes arching: culms stiffly erect, slender, terete, usually overtopping the leaves, 2.1–7.2 dm. high: inflorescence composed of several small fascicles aggregated at the summit of the culm so as to produce the effect of a congested cylindric spike, occasionally 3 cm. long, 1 cm. wide; a single remote lateral "spike" may also occur on a slender exserted peduncle: spikelets ovoid, tightly imbricate, with 1–3 florets, 1–2-fruited, 3–5 mm. long: scales obtuse to mucronulate, castaneous: bristles 6, falling short of the achene to exceeding the tubercle, thickly clothed with glistening white hairs which diminish more or less suddenly near the tip to antrorse serrulations: achene rotundly obovoid, transversely rugulose to ridged, evenly brown, 1.1–1.4 mm. wide, 1.4–1.8 mm. long: tubercle depressed, conical-apiculate or more rarely attenuate, sparingly serrulate. Plate 820, figs. 2A and 2B; Map 16.—Sk. Bot. S. Car. and Ga. i. 58 (1816); Gray, Ann. Lyc. N. Y. iii. 203, pl. 6, fig. 10 (1835); Chapman, Fl. So. U. S. 524 (1860); Clarke in Urban, Symb. Ant. ii. 123 (1900); Small, Fl. 194 (1903) and Man. 180 (1933); Britton, Mem. Soc. Cubana Hist. Nat. ii. 195 (1916). *R. semiplumosa* Gray, Ann. Lyc. N. Y. iii. 213, pl. 6, fig. 23 (1835); Chapman, Fl. So. U. S. 524 (1860); Small, Fl. 194 (1903) and Man. 180 (1933). *R. penniseta* Grisebach, Cat. Pl. Cub. 244 (1866); C. Wright in Sauvalle, Anal. Acad. Ci. Habana, viii. 84 (1871) and Fl. Cub. 180 (1873). *Schoenus ciliaris* sensu Muhlenberg, Descrip. Gram. ii (1817), non Michaux. *Phaeocephalum plumosum* House, Am. Midland Nat. vi. 202 (1920).—Open, sandy, dry to moist ground mostly in pine barrens of the Coastal Plain from North Carolina south to the tip of Florida, and west to Texas; also in the western provinces of Cuba, the Isle of Pines



Range of 10, Rhynchospora capillacea; 11, R. Knieskernii; 12, R. macra; 13, R. intermedia; 14, R. oligantha, var. breviseta; 15, R. oligantha, var. typica; 16, R. plumosa; 17, R. ciliaris; 18, R. pallida; 19, R. Chapmanii; 20, R. brachychaeta; 21, R. sola; 22, R. solitaria; 23, R. nuda; 24, R. fusca; 25, R. pleiantha; 26, R. Curtissii; 27, R. Harperi; 28, R. crinipes; 29, R. fuscoides; 30, R. leptorhyncha; 31, R. Gageri; 32, R. joveroensis; 33, R. Baldwinii; 34, R. Fernaldii; 35, R. filifolia

and Central America. North Carolina: dry savanna, 15 miles southeast of Greenville, Pitt Co., *Blomquist*, no. 11252 (D); savanna at Chocowinity, Beaufort Co., *Godfrey*, no. 5403 (G); sandy soil, marsh, Harker's Island, Carteret Co., *Randolph & Randolph*, no. 843 (G); moist black soil, low ground, Dixon, Onslow Co., *Randolph & Randolph*, no. 946 (G); savanna at Burgow, Pender Co., *Godfrey*, no. 4736 (G, NC); sandy pine barrens, west of Leland, Brunswick Co., *Wiegand & Manning*, no. 619 (G); dry sandy soil, Fayetteville, Cumberland Co., *Biltmore Herb.*, no. 243b (CU, G, P). South Carolina: peaty excavated area in savanna at side of road, 12 miles north of Georgetown, Georgetown Co., *Godfrey & Tryon*, no. 7 (CU, D, G, NY, P); ½ mile south of Manning, Clarendon Co., *Stone*, no. 713 (P); open white sandy, oak-pine woods, 1 mile east of Eutawville, Orangeburg Co., *Godfrey & Tryon*, no. 833 (G). Georgia: in pinetis aridis, Geor. Car., *Elliott* (G, type-photo); moist pine barrens, Bullock Co., *Harper*, no. 893 (G, NY); low pine barrens southeast of Dublin, Laurens Co., *Harper*, no. 1372 (G, NY, US); moist rocks near Ohoopee River, Tattnall Co., *Harper*, no. 2156 (G, US); pine barren, 2 miles south of Savannah, Chatham Co., *Eyles*, no. 6087 (CU); pine barrens a few miles east of Eulonia, McIntosh Co., *Eyles*, no. 6437 (CU); dominant in piney woods, Billy Island, Charleton Co., Bradley, no. 1 (P); moist pine barrens, Coffee Co., *Harper*, no. 706 (NY, US); forming wiry clumps in moist pine barrens south of Sylvester, Worth Co., *Svenson*, no. 6936 (CA, G); pine barren, north of Hahira, Cook Co., *Eyles*, no. 3796 (CU); damp margin of cypress pond, about 1 mile north of Jakin, Early Co., *Harper*, no. 3629b (NY). Florida: dry pine barrens near Jacksonville, Duval Co., *Curtiss*, no. 4867 (G, NY, US); north of Macclenny, Baker Co., *Eyles*, no. 5864 (CU); Hibernia, Clay Co., March, 1869, *Canby* (G, P, US); Cypress-Ilex-Myrt. swamp, west of Lawtey, Bradford Co., *West & Arnold* (CU); in a wet ditch in pineland, Gainesville, Alachua Co., *O'Neill*, no. 621 (CU); moist flatwoods, Welaka, Putnam Co., June 29, 1939, *Laessle*, no. 17 (CU); low pine barren, Okeechobee Region, Brevard Co., *Fredholm*, no. 5740 (G); in a low pineland, Aripeka, Pasco Co., *Leonard*, no. 1414 (CU); Tampa and vicinity, Hillsborough Co., May, 1897, *Berg* (NY); in dry sandy soil, about 5 miles north of Parrish, Manatee Co., *Moldenke*, no. 1052 (D, NY); Punta Gorda, DeSoto Co., *Eaton*, no. 1284 (G); in moist sandy soil at edge of ditch, Fort Myers, Lee Co., *Moldenke*, no. 675 (D, NY); Miami, Dade Co., Mar., 1877, *Garber* (G, P); in low pineland, Otter Creek, Leon Co., *O'Neill*, no. 725 (CU); Apalachicola prairies, Franklin Co., *Small, DeWinkler & Mosier*, no. 11248 (NY); boggy turfy sandy meadow, 7 miles west of Sneads, Jackson Co., *Wiegand & Manning*, no. 678 (G); moist pine barrens, Argyle, Walton Co., *Curtiss*, no. 6488 (G, NC, NY, US); small

savanna near coastal highway, about 12 miles east of Pensacola, Santa Rosa Co., *Harper*, no. 3745 (G, NY). Alabama: Gateswood, *Tracy*, no. 8617 (G, NY, US); Mobile, Mobile Co., *Sullivant* (G). Mississippi: Ocean Springs, Jackson Co., *Skehan*, no. 22617 (G); Biloxi, Harrison Co., *Tracy*, no. 4861 (G, US). Louisiana: open pineland, 1 mile north of Abita Springs, St. Tammany Parish, *Pennell*, no. 4154 (NY); New Orleans, 1834, *Dr. Ingalls* (NY, type of *R. semiplumosa*, very immature); wet prairies, Welsh, Jefferson Davis Parish, *Palmer*, no. 7669 (CA, Mo, P, US); low prairies, vicinity of Lake Charles, Calsasieu Parish, *Mackenzie*, no. 444 (Mo, NC, NY). Texas: San Antonio, Bexar Co., Sept. 20, 1891, *Plank* (NY); E. Tex., *Wright* (G). Cuba: in sandy pinelands close to the laguna, Laguna Santa Maria, Pinar del Rio, *Ekman*, no. 17250 (G); moist places, Mateo Sanchez, Pinar del Rio City, Pinar del Rio, *Ekman*, no. 17941 (US); pine woods, Herradura, Pinar del Rio, *Earle*, no. 756 (NY, US); Vinales, Pinar del Rio, *Leon*, no. 18905 (CU); Pinales, Los Almacigos Pinar del Rio ? July 29, and high pinales, Vinales, Pinar del Rio, Mar. 1, *Wright*, no. 3398 (G; NY, US, same number without locality); savanna, San Pedro and vicinity, Isle of Pines, *Britton & Wilson*, no. 14296 (G, NY, US); vicinity of Sopopo, Buenos Aires, Trinidad Mt., Santa Clara, *Smith, Hodgdon & Gonzalez*, no. 3341 (CU, G, US).

Series 3. **Chapmaniae,** ser. nov. Inflorescentia saepe e fasciculo solitario terminali composita: spiculis sterilibus fusiformibus saepe numerosis: setis antrorse serrulatis achaenio duplo brevioribus vel nullis rare 3–4 fragilibus tuberculo aequalibus: achaenio obovato elliptico vel fere orbiculari lenticulari valde compresso punctato vel foveolato vel laevi: tuberculo basi lato brevi saepe apiculato.

Plants mostly of low pinelands, occasionally standing in shallow water of ponds of the Coastal Plain and the West Indies. Habit stoloniferous or caespitose: leaves filiform to 6 mm. broad in *R. ciliaris:* culms erect to loosely ascending, usually slender to filiform: inflorescence often consisting of the solitary terminal fascicle: spikelets of several species split open by the developing achene; fusiform sterile spikelets numerous: bristles usually none to rudimentary, equalling the tubercle only in *R. solitaria* but then extremely fragile and less than six, antrorsely serrulate: achene obovate to elliptic or nearly orbicular, lenticular but usually strongly compressed, pitted (rarely faintly rugulose) to smooth, with or without a central disc: tubercle broad-based, short, often apiculate.—*Rhynchospora* III. *Pusillae* Small, Man. 175 (1933), in part. *Rhynchospora*, Series B. *Diplostyleae*, Divisio 4. *Psilocarya*, Sect. ii. *Pauci-Nucigerae* Clarke, Kew Bull. Add. Ser. viii. 119 (1908), in part.

(*To be continued*)

NOTES ON THE FLORA OF ROANOKE COUNTY, VIRGINIA

Carroll E. Wood, Jr.

(*Continued from page 86*)

Stylosanthes riparia Kearney. Many numbers, (A, G, P). This seems to be the common species of the genus in Roanoke County, being found in almost every dry, acid woodland. *S. biflora,* on the other hand, is comparatively rare and has been noted only on Chestnut Ridge (no. 5304, P).

Lespedeza striata (Thunb.) H. & A. Seen only once, on a roadside on East Ridge, South Roanoke, no. 5294 (P).

L. stipulacea Maxim. Widely escaped along roadsides throughout the county. Many numbers (A, G, P).

L. cuneata G. Don. Several plants in an old limestone quarry on Carvin Creek about 2 miles south-southwest of Hollins, no. 5529 (A, G, P).

An erect, annual, Asiatic species, originally introduced as a field-crop but widely escaped in southeastern Virginia[1] and now appearing farther west.

L. Nuttallii Darl. Scattered plants in dry, rocky soil among *Quercus ilicifolia* on an exposed ridge, north slope of Fort Lewis Mountain, about 4.7 miles northwest of Salem P. O., no. 5638 (P).

Clitoria mariana L. In dry soil in oak-pine woods, Chestnut Ridge, south of South Roanoke, no. 5302 (P); shaly soil in oak woods, Green Ridge, 1½ miles north-northeast of Hanging Rock, no. 3078 (P); open, shaly slope above fire-road along Green Ridge, 2 miles north-northeast of Hanging Rock, no. 3438 (G).

These localities add to the three stations in western Virginia shown by Fernald in his map of the species in Rhodora **39:** 479. Map 55. 1937.

Oxalis violacea L., var. trichophora Fassett. Wooded, sandy flats along Roanoke River below Wabun, no. 1084 (P).

O. florida Salisb. Moist shoulders of a fire-road in a cool, wooded ravine of Fort Lewis Mountain, northwest of Dixie Caverns, no. 5573 (P); neglected field near Shiloh Church, no. 5446 (P).

Erodium cicutarium (L.) L'Hér. Weedy ground, High Street, Salem, May 15, 1940, *G. G. Peery* (Roanoke College); Blue Hills Golf Course, May 15, 1942, *P. M. Patterson* (Hollins College).

[1] See Fernald, Rhodora **40:** 437. 1938.

Polygala polygama Walt., f. obovata Blake. Shaly soil in dryish oak-pine woods along Fire-Road 4058, about 4 miles northwest of Dixie Caverns, no. 2660 (G).

Professor Fernald writes me that this is typical of the plant described by Blake from Florida and Louisiana with its short and elliptical to obovate leaves. He further notes that this is the first he has seen from so far north: all of the Gray Herbarium material comes from Florida and Arkansas. Other Roanoke County specimens can also be placed here. The plant is not uncommon in dry, open woods along the ridges in the northern part of the county.

P. incarnata L. Dry oak woods, 1.8 miles north by west of Salem P. O., no. 5050 (P); neglected field, 1.6 miles southwest of Salem P. O., no. 816 (P).

This adds another western Virginia county to those shown by Fernald in his map of this species with stations in the Appalachians and on the Coastal Plain[1].

Croton glandulosus L., var. septentrionalis Muell. Arg. Open, pastured hilltop, 1 mile north of Salem P. O., no. 5720 (A, G, P).

Phyllanthus caroliniensis Walt. Abundant with *Cyperus densicaespitosus* in disturbed, sandy soil near the Baptist Orphanage Pool, 1 mile north of Salem P. O., no. 5716a (G, P).

Euphorbia marginata Pursh. Sparingly escaped; scattered plants along the roadsides near Fort Lewis Church, Glenvar, no. 3963 (P); Salem, no. 5038 (P).

E. dentata Michx. Rather widely distributed in disturbed soils and apparently spreading, in some areas (especially around Salem and Roanoke) becoming a rank weed. Many numbers (G, P). No. 5039 (P) from Salem has the upper bracts pinkish at the base instead of whitened.

Rhus copallina L. Open, dry woods along Fire-Trail 4058, about 4 miles northwest of Dixie Caverns, no. 2613 (P).

This is the typical form of the species characterized by having "lance-oblong leaflets definitely attenuate at the base" and comparatively more leaflets than the inland and upland var. *latifolia* Engler which is commonly found in this area. Fernald and Griscom give the range of the typical variety as along the coast from Florida northward and locally to southern New York.[2]

Impatiens pallida Nutt., f. speciosa Jennings. (Ohio Journ.

[1] Rhodora **39**: 483. Map 59. 1937.
[2] Rhodora **37**: 167–168. 1935.

Sci. **20:** 204. 1920.) Moist alluvium in thickets at the base of steep, dolomite bluffs along the Roanoke River, 1¼ miles south-southwest of Salem P. O., nos. 5231 (P), flowers pale cream; 5528 (P), flowers pale yellow; 5232 (P), flowers yellow.

Flower-color in this luxuriant colony varies from almost pure white with a few red dots on the inner surface of the saccate sepal to the usual bright yellow, with almost every intermediate shade represented.

Hibiscus palustris L. (See Fernald, Rhodora **44:** 266–278. 1942.) Scattered clumps in a wet meadow along the west branch of Lick Creek, about 1 mile west of Round Hill, no. 5512 (A, G, P).

These specimens seem to be intermediate between *H. palustris* and *H. Moscheutos* L. as recently defined by Fernald. Most characters tend towards *H. Moscheutos*, but the red-eyed, white flowers have the hispid styles of *H. palustris*. The occurrence of colonies such as this obscures the distinctions between the two Linnean species.

Malva sylvestris L., var. mauretiana (L.) Boiss. Roadsides, 4.8 miles southwest of Airpoint P. O., no. 3219 (G, P). Scattered along roadsides in the Bent Mountain area of the southwestern part of Roanoke County.

Ascyrum hypericoides L., var. typicum Fern. (Rhodora **38:** 432. 1936.) Shrubby plant about 18 inches high in dry soil in open pine-oak woods between Yellow and Buck Mountains on Route 311, about 5¼ miles due south of Roanoke P. O., no. 5359 (A, G, P).

This material with axillary fascicles and linear-oblong leaves is quite typical and matches well material from the Coastal Plain from which this station represents an extension inland to the Blue Ridge. The wide-ranging form, var. *multicaule* (Michx.) Fern., is common in dry woods throughout the county.

Viola rostrata Pursh. Many scattered plants in rocky woods along a small stream at the base of Fort Lewis Mountain, 1.8 miles north-northwest of Salem P. O., no. 2491 (P); April 25, 1940, *C. E. Wood, Jr.*, (P). Rare this far south.

Decodon verticillatus (L.) Ell., var. laevigatus T. & G. Abundant in an open, spring-fed marsh at the headwaters of Deer Branch, near the old Hollins School, no. 5467 (G, P).

Epilobium coloratum Muhl. Abundant in open marsh with *Decodon verticillatus*, no. 5507 (G, P).

Aralia spinosa L. A single plant seen in moist woods,

ravine of Fort Lewis Mountain, 3 miles north-northwest of Salem P. O., no. 2521 (P).

Hydrocotyle ranunculoides L. f. Shallow water in an open, spring-fed marsh at the headwaters of Deer Branch, no. 5460 (P).

Noted by Fernald in Princess Anne, Surrey, and Sussex Counties in southeastern Virginia[1], this is another of the predominately Coastal Plain species with stations in the Appalachian Uplands.

Sium suave Walt. Shallow water in open marsh, as above, no. 5508 (P).

Bupleurum rotundifolium L. Rocky field along Fire-Trail no. 4058 at Bradshaw, 4 miles northwest of Dixie Caverns, nos. 3888 (P), 2630 (G, P).

Pseudotaenidia montana Mack. Shaly soil in oak woods, saddle of Fort Lewis Mountain, 2.9 miles north-northwest of Dixie Caverns, altitude 2800 feet, no. 3903a (P); summit of Green Ridge, 1.8 miles north by east of Hanging Rock, no. 3402 (G).

Cornus racemosa Lam. Low shrub in dry soil, summit of Fort Lewis Mountain at the head of the ravine of Stypes Branch, no. 5598 (P); river margin, 1¼ miles south-southwest of Wabun, no. 4076 (P).

Rhododendron roseum Rehd. Rocky, acid soil in oak woods, slope of Poor Mountain, 2.6 miles south of Wabun, nos. 5706 (P), 3792 (P); rocky woods, summit of Fort Lewis Mountain, 3 miles north by west of Glenvar, no. 5616 (P). Supposedly rare this far south.

Leucothoë recurva (Buckley) Gray. Shrub, 3–4 feet high, with *Pinus pungens* and *Rhododendron catawbiense* on a dry ridge of Poor Mountain, 3 miles south of Wabun, no. 3778 (A, G, P).

Vaccinium angustifolium Ait., var. laevifolium House. Cool, red-oak woods, summit of Fort Lewis Mountain, 3 miles north by west of Glenvar, no. 5615 (P); among low scrub, open summit of Poor Mountain, altitude 3960 feet, no. 5688 (P). Near its apparent southern limit.

V. erythrocarpum Michx. Cool, moist, northern slope of Fort Lewis Mountain, 4.7 miles northwest of Salem P. O., no. 5636 (P). Rare in this region.

Lysimachia hybrida Michx. Growing in abundance in 6–12 inches of water in a shallow pond-hole at the foot of Fort Lewis Mountain, about 1.9 miles north by west of Salem P. O., no. 5090 (G, P).

[1] Rhodora **39**: 437. 1937.

TRIENTALIS BOREALIS Raf. Cool, moist woods along Bottom Creek, Poor Mountain, 2¼ miles northwest of Airpoint P. O., no. 1121 (P); moist, wooded slope, 3 miles southwest of Airpoint P. O., no. 3192 (P).

GENTIANA QUINQUEFOLIA L. Roadside runnel in cool, red-oak woods, ridge of Poor Mountain, 5 miles south-southwest of Singer P. O., no. 5701 (G, P).

G. ANDREWSII Griseb. Cool, oak woods along the summit of Poor Mountain, altitude 3000 feet and over, nos. 5674 (P), 5699 (A, G, P).

VINCA MINOR L. Persisting and spreading on roadbanks near the site of an old house in a wooded ravine of Fort Lewis Mountain, north-northwest of Dixie Caverns, no. 5566 (P).

PHLOX OVATA L., var. LATIFOLIA (Michx.) Wherry. Widely scattered throughout the county, many numbers (P, A); cool, moist woods along a small stream, 1¾ miles west-northwest of Bent Mountain P. O., no. 3255 (P), a form with an extreme number of nodes (9) below the inflorescence.

SYMPHYTUM OFFICINALE L. With *Impatiens biflora* in wet ground along a small stream, ¼ mile west of Airpoint P. O., on Route 612, no. 3886 (G, P).

SCUTELLARIA PARVULA Michx., var. AMBIGUA (Nutt.) Fern. (*S. Leonardi* Epling). Dry soil in an old pasture with dolomite outcrops on Roanoke River at Dixie Caverns, no. 3647 (G, P).

S. SAXATILIS Riddell. Rock slide in oak woods, slope of Poor Mountain, 2.6 miles south of Wabun, no. 5647 (G, P); 3785 (A, P); rock slide, Fort Lewis Mountain, 3 miles north-northwest of Salem P. O., no. 2553 (P). The habitat is quite characteristic and where this obtains the plant is abundant.

S. OVATA Hill, var. VERSICOLOR (Nutt.) Fern. Shaly soil among *Quercus ilicifolia*, slope of Fort Lewis Mountain, 2.9 miles north-northwest of Dixie Caverns, no. 3923 (P); along Stypes Branch, 2 miles northwest of Glenvar, no. 3954 (P).

MELISSA OFFICINALIS L. Along weedy roadsides near Catawba Sanitarium, no. 5434 (P).

MENTHA CITRATA Ehrh. Weed in stream-bed at Hollins College, Sept. 14, 1942, *P. M. Patterson* (Hollins College). Apparently not previously noted from this region.

LINDERNIA ANAGALLIDEA (Michx.) Pennell. Moist depression with *Diospyros*, E. A. Smyth, Jr. estate, 1.6 miles southwest of Salem P. O., no. 5019 (A, G, P). A predominately coastal plain type here entering the mountains.

VERONICA HEDERAEFOLIA L. Forming dense mats in thickets along Roanoke River, 2 miles south-southwest of Salem P. O., no. 1900 (G, P).

GERARDIA TENUIFOLIA Vahl, var. TYPICA Pennell. Stony, leached soil in cool woods, Gravelly Ridge, near the Roanoke-Botetourt County line, no. 5376 (A, P).

Aureolaria pedicularia (L.) Raf., var. austromontana Pennell. Dry woods, Chestnut Ridge, south of South Roanoke, no. 5297 (P). Here near its northern limit. A. pedicularia, var. typica, with a smaller capsule and lacking glandular hairs, is frequent in dry woods.

Plantago major L. Wet meadow near the headwaters of Deer Branch near Hollins School, no. 5472 (P). A rare weed here!

Galium parisiense L. In fields near the E. A. Smyth, Jr. estate, 1.6 miles southwest of Salem P. O., no. 5013 (P); fields, Hollins, June 18, 1942, *P. M. Patterson* (Hollins College). Not reported previously from this part of the state.

Viburnum alnifolium Marsh. Cool, moist woods along Bottom Creek, Poor Mountain, 2¼ miles northwest of Airpoint P. O., no. 3840 (G, P). A northern species found here only at high altitudes.

V. Rafinesquianum Schultes. (*V. affine* Bush, var. *hypomalacum* Blake.) Low shrub (4–5 feet) at the dry, wooded summit of Fort Lewis Mountain at the head of the deep ravine of Stypes Branch, no. 5599 (G, P).

Dipsacus sylvestris Huds. Widely established along roadsides and in old fields, no. 5397, 3964 (P).

Vernonia glauca (L.) Willd. Roadside, edge of oak woods, 3.7 miles south-southwest of Roanoke P. O., no. 5306 (P); marsh along Catawba Creek, east of Catawba Sanitarium, no. 5425 (P). Occurring mostly on the Coastal Plain but with colonies such as these pushing into the mountain region.

Eupatorium rotundifolium L., var. ovatum (Bigel.) Beck. Dry woods along Stypes Branch, 2 miles northwest of Glenvar, no. 3957 (P); in dry soil at the edge of oak woods, 1.8 miles north by west of Salem P. O., no. 5051 (P).

E. sessilifolium L., var. Vaseyi (Porter) Fern. & Grisc. (Rhodora **37:** 180. 1935.) Green Ridge, 1 mile north by east of Hanging Rock, no. 3047 (P); dry, sterile soil in scrubby woods, 1 mile north of Salem P. O., no. 5005 (G).

This variety with shorter, pubescent leaves not long-acuminate as in the typical form is well marked in this region, but is much less abundant than the typical, glabrous form, common in dry soils throughout the area.

Erigeron strigosus Muhl., var. Beyrichii (F. & M.) T. & G. Moist, wooded ravine of Fort Lewis Mountain, 3 miles north-northwest of Salem P. O., no. 2526 (P); dry pine woods, 1.9 miles northwest of Salem P. O., no. 2467 (P); dry woods at Dixie Caverns, no. 3349 (P). Apparently new to the mountain region.

Antennaria solitaria Rydb. Moist woods along a small stream, 1 mile north of Salem P. O., April 11, 1940 (*C. E. Wood and C. W. Gottschalk* (P, Roanoke College); roadbank in dry oak woods, Green Ridge, 1 mile north by east of Hanging Rock, no. 3065 (A, P), leaves very wooly and soft to the touch beneath; moist, wooded slope along Back Creek, 1.9 miles south-southwest of Cave Spring, no. 3329 (G, P).

A. Parlinii Fern. Open oak woods, Green Ridge, northeast of Hanging Rock, no. 3417 (G, P); dry, shaly woods, Fort Lewis Mountain, north-northwest of Dixie Caverns, no. 3989 (A, P).

Silphium compositum Michx., var. reniforme (Raf. ex Nutt.) T. & G. Dry, shaly slope along a small stream at the base of Fort Lewis Mountain, 4 miles northwest of Dixie Caverns, no. 2634 (G, P); dry, shaly woods, gap at the summit of Fort Lewis Mountain, 2.9 miles north-northwest of Dixie Caverns, no. 3918 (P).

Recorded by Wherry on the southwestern-most shale barren a few miles distant on the end of Fort Lewis Mountain in Montgomery County (see *Castanea* **4**: 137. 1939).

Parthenium hispidum Raf. (*P. auriculatum* Britton). Steep dolomite bluffs along Roanoke River at Dixie Caverns, no. 3633 (G, P).

Rudbeckia hirta L., var. monticola (Small) Fern. Openings in second-growth woods, ridge of Poor Mountain, 3¼ miles south of Wabun, no. 5671 (P).

R. hirta, var. sericea (T. V. Moore) Fern. Widely scattered, nos. 868, 2708, 3286 (P).

R. fulgida Ait. Wet meadow adjacent to a spring-fed marsh at the headwaters of Deer Branch near Hollins School, no. 5464 (A, G, P).

Brauneria laevigata Boynton & Beadle. (*Echinacea laevigata* (B. & B.) Blake.) In shaly soil among low scrub and at the margins of a small shale barren on Fort Lewis Mountain, 2.9 miles north-northwest of Dixie Caverns, no. 3921 (A, G, P).

This adds another station to those recorded by A. B. Massey from Montgomery and Nottaway Counties in *Claytonia* **5**: 49. 1939.

Bidens comosa (Gray) Wieg. Abundant in a marsh along the west branch of Lick Creek, 1 mile west of Round Hill, no. 5516 (P).

B. laevis (L.) BSP. Margin of a small stream north of Salem, no. 5711 (A, P); open marsh at the headwaters of Deer Branch, no. 5499 (A, P).

Senecio antenariifolius Britton. Exposed, shaly slope among *Quercus ilicifolia*, Fort Lewis Mountain, 2.9 miles north-

northwest of Dixie Caverns, no. 3922 (G, P); dry ledges above Mason Creek, 1¼ miles north of Hanging Rock, no. 2742a (P).

Found by Wherry on a shale barren in adjacent Montgomery County and reported by him in *Castanea* 4: 137. 1939. At all three localities the *Senecio* grows with *Clematis albicoma*, var. *coactilis* Fern., one of the specialties of the region.

Centaurea maculosa Lam. Well established in this part of Virginia, nos. 870, 3663 (P).

C. vochinensis Bernh. Well established in the vicinity of Salem; Broad Street, Salem, no. 820 (P, Roanoke College); 1 mile north of Salem P. O., no. 5729 (G).

Lapsana communis L. Dry, shaly bank along road, just west of Dixie Caverns, no. 1183 (A, G, P).

Apparently a rare weed in Virginia, but spreading. Fernald records the plant from Southampton and Henrico Counties in southeastern Virginia[1] and it has been collected in Giles County, northwest of Roanoke County (*Fogg*, no. 12459 (P) and *P. M. Patterson* (Hollins College)).

Hypochaeris radicata L. Blue Hills Golf Course, May 28, 1942, *P. M. Patterson* (Hollins College).

Crepis capillaris (L.) Wallr. Hollins College, August 11, 1935, *P. M. Patterson* (Hollins College).

Hieracium Pilosella L. Widely distributed, many numbers (G, P).

H. pratense Tausch. Like the preceding, well established on roadbanks and in old fields throughout Roanoke County and in this part of Virginia in general, many numbers (G, P).

Botanical Laboratory,
University of Pennsylvania.

Mikania scandens in Southern New Hampshire.—The recent discovery of *Mikania scandens* at two stations in southeastern New Hampshire seems to merit brief mention, particularly in view of the fact that the reported northeastern limit of its range is open to question.

Mr. Maurice Provost discovered the first of the two new stations for *Mikania* in July, 1940, near the outlet of Phillip's Pond in the township of Sandown in Rockingham County. Mr. Provost was a graduate student at that time in Biology at the

[1] Rhodora 42: 498. 1940.

University of New Hampshire and during the summer months was carrying on a survey of ponds for the New Hampshire Fish and Game Department. Mr. Provost, who is a keen field botanist, found nearby a colony of *Hottonia inflata* which, like the *Mikania*, is highly localized so far north but which is represented in herbaria by at least two collections from Maine.

Early in October of the present year, 1943, on one of my infrequent botanizing excursions of the season, I had the satisfaction of finding *Mikania* about twenty miles north of Provost's station. This colony is in Barrington, near the outlet of Long Pond. The plants were in full flower at the time of my visit despite the lateness of season and the extreme northern location of the colony.

Mikania scandens is known definitely from northeastern Massachusetts. Specimens in the Gray Herbarium and the New England Botanical Club Collections from Westford, Middleton, Topsfield and Georgetown show the species to be well known in that area. There seems to be much doubt, however, concerning earlier reports of *Mikania* from New Hampshire and Maine. F. W. Batchelder includes the name *Mikania scandens* in his list of Manchester Plants but in my opinion casts doubt on its actual occurrence by using the qualifying notation "Rare."[1] Thus far I have been unable to locate any herbarium material of it. The situation in Maine is hardly more clear. A specimen from Kate Furbish in the Herbarium of the New England Botanical Club from Brunswick, bearing the date August and September, 1916, would seem to clinch the matter. However, as Professor Fernald pointed out to me recently, the label is not original and there is considerable doubt as to the accuracy of this and some other collections of Miss Furbish which bear copied labels.

It would seem, therefore, that the two recent collections of *Mikania scandens* are from the sole New Hampshire stations and that they represent the northeastern limit of range of the species until further stations are located or the previous doubtful stations are confirmed.

Mr. Provost's specimens of *Mikania scandens* and *Hottonia*

[1] Preliminary List of Plants Growing without Cultivation in the Vicinity of Manchester, New Hampshire revised and enlarged (1909), p. 44.

inflata are in the Herbarium of the University of New Hampshire. Specimens of mine of *Mikania* from Barrington have been presented to the Gray Herbarium and the New England Botanical Club.—A. R. Hodgdon, University of New Hampshire, Durham.

Fimbristylis Baldwiniana not the same as F. annua.—There is a recent tendency to reduce the eastern North American *Fimbristylis Baldwiniana* (Schultes) Torr. to the Old World *F. annua* (All.) R. & S. (1817), based on *Scirpus annuus* All. (1785), originally from Italy, or to the pantropical and subtropical *F. diphylla* (Retz.) Vahl, a coarser plant than *F. annua*, treated by Kükenthal as *F. annua*, var. *diphylla*. *F. annua*, unknown, apparently, in North America, is a tufted annual, and its longitudinally ribbed and reticulate achenes are otherwise smooth. *F. diphylla* is a coarser perennial, with prolonged hard leaves, relatively crowded spikelets and achenes without prominent hubbling. In the United States it occurs in southern Georgia and Florida, thence to eastern Texas. It is correctly defined by Small. *F. Baldwiniana* is a small tufted annual with narrow and soft leaves and few scattered spikelets. Its achenes are somewhat like those of the Old World *F. annua* and the pantropical *F. diphylla* but roughened with large tuberculate processes. They were illustrated in Rhodora, xxxvii. pl. 389 (1935), and all authors who have understood such fundamental characters have emphasized them. The species started as *Scirpus sulcatus* Ell. Sk. i. 86 (1816), Elliott giving a beautifully accurate account of it, with "edges of the *seed* . . . toothed by tubercles", the plant first sent to him by Baldwin. On account of the earlier *S. sulcatus* Thouars, Schultes, Mant. ii. 85 (1824) renamed the species *S. Baldwiniana* and Torrey, transferring it to *Fimbristylis* as *F. Baldwiniana* (Schultes) Torr. in Ann. Lyc. Nat. Hist. N. Y. iii. 344 (1836), clearly and correctly defined the "nut marked with tuberculated ribs and transverse striae". Again, on account of an earlier *Scirpus sulcatus*, Spreng. Syst. Nat. iv. Cur. Post. 28 (1827), renamed our plant *S. Elliottii*. Much later, Pennell, thinking the plant of the serpentine barrens of Delaware, Pennsylvania and Maryland a distinct species, described it as *F. Darlingtoniana* Pennell in

Bartonia, xv. 30 (1933), with "achene . . . at least distally with low warty knobs". That the latter species is not separable from *F. Baldwiniana* I showed in Rhodora, l. c.

The type of *Scirpus sulcatus* Ell., photographed by Mr. and Mrs. Weatherby, was recorded by Weatherby in Rhodora, xliv. 261 (1942) as identical with *F. diphylla* (Retz.) Vahl, with the note that it had been determined by Boynton & Beadle as *F. laxa*. There has been considerable confusion, for *F. laxa* was described from South America, as a plant with filiform leaves and decompound umbels. Our *F. Baldwiniana* was misidentified with it in Britton & Brown, Ill. Fl. ed. 1 (1896) and in Gray's Man. ed. 7 (1908) but the error was corrected in ed. 2 (1913) of Britton & Brown. The identification of Elliott's plant with *F. diphylla* can hardly stand, for, as already noted, the latter, occurring in tropical America and the Old World, northward with us into Georgia, is a much coarser perennial, with almost rigid leaves, with very compound inflorescences and with achenes not tuberculate-roughened.

Recently, *F. Baldwiniana* has appeared, in McVaugh, Ecol. Monog. xiii. 151 (1943), as a synonym of *F. annua*. Close study of the achenes of the latter Old World plant would reveal real differences. Only if we merge as one species the tufted and stoloniferous *F. caroliniana* (Lam.) Fern. and the densely cespitose, hard and nonstoloniferous *F. castanea* (Michx.) Vahl because fragmentary pieces (not good specimens) look superficially similar, or unite the American *Eleocharis obtusa* (Willd.) Schultes and the circumboreal *E. ovata* (Roth.) R. & S. because superficially they resemble one another (but have different tubercles) can *Fimbristylis Baldwiniana* be merged with *F. annua*.—M. L. Fernald.

Three neglected Names in Scirpus.—Scirpus cernuus Vahl var. **californicus** (Torr.), comb. nov. *Isolepis leptocaulis* Torr., Bot. Whipple Exped. 97. 1857. *Isolepis pygmaea* var. *californica* Torr. Bot. Wilkes Exped. 476. 1874.

In its North American dispersal *Scirpus cernuus* Vahl (long known as *Scirpus riparius* (R. Br.) Spreng.) is, unlike the superficially similar *Scirpus setaceus* L., native. Although the achenes are apparently identical with those of the European

material of the species, habitally the plants of this hemisphere are quite different, being characterized by generally shorter, stouter, often somewhat curved and densely clumped culms. The North American variety, which occurs in wet places near the coast from British Columbia south to Mexico, is more closely related to the South American material, *Scirpus cernuus* Vahl var. *pygmaeus* (J. Ball) Dusén, than to the European typical *S. cernuus* Vahl.

S. cubensis Poeppig & Kunth var. **gracilis** (Boeck.), comb. nov. *Scirpus ablepharus* Griseb. Cat. Pl. Cub. 240. 1866. *Anosporum cubense* Boeck. var. *gracile* Boeck. Linnaea **36:** 414. 1869–70. *Kyllingia scirpina* Rchb. in Boeck. Linnaea **36:** 414. 1870.

Like *Scirpus cubensis* but culms slender, with narrow leaves only up to 5 mm. broad, and equally narrow involucral bracts; heads small, only up to 1 cm. broad. Inland swamps of tropical and subtropical America.

S. cyperinus (L.) Kunth forma **cephaloideus** (Sheldon), comb. nov. *Scirpus sylvaticus* f. *cephaloideus* Sheldon, Minn. Bot. Studies **1:** 68. 1894.

The type is from Mille Lacs County, Minnesota. This form, characterized by its congested panicles, is otherwise identical with typical *Scirpus cyperinus*.—A. A. Beetle, University of California, Davis, California.

ACTAEA ALBA VERSUS ACTAEA PACHYPODA

H. A. Gleason

Mackenzie in 1928 (Torreya **28:** 51–52) and Fernald in 1940 (Rhodora **42:** 260–264) have discussed the nomenclature of the plant commonly known as *Actaea alba* (L.) Mill. Both surprisingly came to the same conclusion that this familiar plant of the Manual Range should be known as *Actaea pachypoda* Ell. Their reasons for reaching this opinion were different. Mackenzie believed that the Linnaean name, originally published as a variety of *A. spicata* L., belongs to the white-berried form of *A. rubra*, while Fernald believed that it properly belongs to the European *A. spicata*. Under either belief the epithet *alba* would

not apply to our well known plant, for which Elliott's specific name would then be used.

The facts set forth by Mackenzie and by Fernald are correct; only the interpretation of these facts is subject to criticism. In brief, Cornut described and illustrated a plant under the name *Aconitum baccis niveis & rubris.* He stated that it grew in "opacis & silvestribus locis" in America, that the white berry became "orbicularis" at maturity and had a purple spot at the summit, but he also saw some red berries. His plate shows an Actaea unmistakably, but in the picture the berries are distinctly obovoid and on pedicels half to twice as long as themselves.

In the absence of any evidence to the contrary, these statements must be accepted as correct. Since no material of Cornut's plant is extant, the correctness must be determined by internal evidence. The description, except the phrase mentioning red berries, applies solely to our common white-berried baneberry. The red berries may have come from the red-fruited form of this species or from *Actaea rubra.* The plate, so far as leaf and raceme are concerned, might represent either species or the European *A. spicata.* The illustration of the fruit, as to shape and pedicels, applies only to *A. spicata,* a species with black fruit. This is the only incongruity.

So far as known, Linnaeus had no specimen of this plant in 1753, but based his variety on Cornut's description and plate. To what plant do Cornut's and Linnaeus' names apply?

It is just as easy to stress the description of the fruit as the plate. No species of Actaea in eastern North America has a white fruit with a purple spot at the summit except our white baneberry.

On the other hand, if we regard Cornut's description as applying to three different species, thereby agreeing with Fernald that "it seems clear that Cornut had mixed material," then the application of the name was settled by Linnaeus himself. Of the three elements included under this view, Linnaeus selected one. He eliminated the black-fruited *A. spicata* and the American *A. rubra* from consideration and based his variety solely on the white-fruited American plant. See his original statement: "β. Aconitum baccis niveis. *Corn. canad.* 76. *t.* 77."

(note that the rest of Cornut's name *& rubris* has been omitted) and "*Habitat* . . . β. Americae." This procedure is in full accord with modern rules of nomenclature.

Our common white baneberry therefore, it seems to me, retains its time-honored name, *Actaea alba* (L.) Mill.

New York Botanical Garden.

Does Trilisa occur in Virginia?—Two species of the southeastern genus *Trilisa*, *T. paniculata* (Walt.) Cass. and *T. odoratissima* (Walt.) Cass., are recorded in our manuals as extending northward into Virginia. Nevertheless, concentrated search for them by Mr. Long and me and our temporary associates has failed to bring them to light. The most northern material of *T. paniculata* in the Gray Herbarium is from Beaufort County, North Carolina, 80 miles south of the pine barrens of Nansemond and Southampton Counties, where superficially somewhat similar *Carphephorus tomentosus* (Michx.) T. & G. and *C. bellidifolius* (Michx.) T. & G. both abound. The strongly vanilla-scented *Trilisa odoratissima* should be obvious when bruised, but the northernmost material I have seen is from Delway, Sampson County, North Carolina, more than 130 miles south of the Virginia line. The confusion started with Michaux, who described both species of *Carphephorus* (as *Liatris*) as exclusively from North Carolina, but described *Liatris paniculata* (*Trilisa*) as growing "a Virginia ad Floridam". Pursh continued this statement of range but admitted *L. tomentosa* (*Carphephorus*) from "Virginia and North Carolina". At present it looks as if the records of the two species of *Trilisa* from Virginia were based on the two species of *Carphephorus* which there abound and which they superficially resemble. Can any one find *Trilisa* in Virginia? —M. L. Fernald.

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"FOSSIL EVIDENCE OF WIDER POST-PLEISTOCENE RANGE FOR BUTTERNUT AND HICKORY IN WISCONSIN"—A REPLY

L. R. Wilson and Ruth M. Webster

In the March, 1943, issue of Rhodora, Dr. S. A. Cain published a critique of the paper "Fossil evidence of wider post-Pleistocene range for butternut and hickory in Wisconsin" by Wilson and Webster (1942). In this paper the authors recorded the discovery of a considerable amount of fossil hickory pollen in a peat bog near Winchester, Vilas County, Wisconsin. This bog is north of the present range of hickory and east of the then known range of butternut in Wisconsin. The authors suggested that because pollen of these trees was absent from the surface layers of the bog, their ranges may be at present narrower in Wisconsin than in the past. Dr. Cain has taken the view that such pollen as appeared in the bog may have been wind-borne. In the critique he states that his criticism is written "because of the realization that the science of pollen analysis can add valuable information to the history of the forest composition and areas providing, however, that the peculiar sources of error of the method are adequately considered and only justified claims are made." The authors are in full realization of the many problems that enter the study of pollen statistics. They feel, however, that the conclusions drawn are not beyond the scope of evidence presented, and that it is necessary to reiterate their views and present accumulated evidence that points toward confirmation of the theory.

The modern distribution of *Juglans* and *Carya* in Wisconsin

was shown to come within approximately 50 and 90 miles respectively of the Winchester bog. Potzger (1943) has since pointed out that *Juglans* grows on Mackinac Island northeast of the Winchester bog. It is known from the northwestern part of Wisconsin, and therefore its modern distribution can be described as sporadic and nearly surrounding the fossil pollen locality. Further search on the morainic soils north of the Winchester bog may even bring to light the genus existing there today.

The authors, following the usual procedure of paleoecologists, based their pollen diagram upon the counting of two hundred fossils at each level studied. Recognizing that this count by no means gives a conclusive picture of the forests and that it does not rule out the possible presence or absence of species not observed in the peat, the authors examined several thousand additional fossils from the critical levels. In the comparative counts, *Carya* appears as 0.5% in several levels and at its greatest abundance as 1.5%, or as one to three grains in a count of two hundred pollen fossils. Cain makes a point of this, stating "which means that their conclusion that these species once grew near the bog is based on finding one grain of each species under consideration, with the exception noted above where there were three grains encountered." The authors had stated that in further examination of the levels, many grains of the pollen in question were found even though it occurs as a relatively small part of the total fossil count. This frequency on the slides is as much as one grain of *Carya* per square centimeter, which is a greater pollen-frequency than *Quercus*, *Fraxinus*, *Ulmus*, *Tilia*, or *Acer* have in the surface sample. These last named genera are living near the bog at the present time, but according to Cain's argument, they might not be existing within the region, and might be represented only by wind-borne pollen from miles away. With regard to the abundance of the two genera of fossil pollen, Cain further states, "obviously, one must still depend upon the percentages for purposes of comparison." With this the authors are in full agreement, but the present problem is not one of comparing *Carya* pollen with any other species; *it is one of determining the paleogeography of Carya.* Potzger (1943), who has had wide experience in the field of pollen statistics, makes

the following statement concerning the significance of the fossil *Juglans* and *Carya* pollen in Vilas County, Wisconsin: "Their arguments [Wilson and Webster] very correctly claim that presence of certain genera, even though their pollen frequency is low, may be of important significance in the interpretation of former distribution of such genera as well as in reconstruction of climatic features which made such distribution possible."

While the authors' paper was awaiting publication, Sears (1942) published a paper on the postglacial migration of five forest genera. He states: "*Carya* pollen occurs in four profiles north of its present range, and in another profile in Itasca County, Minnesota, where its modern occurrence is sporadic. In all of these five profiles its behavior is identical. It shows as a trace, and only at the level of the distinct oak maximum which marks Period IV." Period IV of Sears corresponds to the upper part of the middle levels described in the Winchester peat. Since the publication of Sears' paper, three other papers (Potzger 1942, 1942a, 1943) have appeared, describing five additional peat deposits in northern Wisconsin north of the modern range of hickory. All but one of these show hickory present in the middle levels of the bogs and absent in the surface peat. The one exception to the above vertical distribution of *Carya* pollen is found in the bog described by Potzger (1943) as the Sunken Highway bog in Price County, Wisconsin. According to Dr. Potzger (personal written communication) the surface sample of peat contains gelatinous material. Such peat is usually not derived from the tops of living *Sphagnum,* therefore one might assume that the sample also contained some subsurface material and was consequently older. This bog is southwest of the Winchester bog, and therefore closer to the present known range of *Carya* in Wisconsin. In addition to the eight cited deposits showing only a near medial level occurrence of *Carya* pollen, the authors (1943) have described a ninth bog from northern Wisconsin with *Carya* present only below the surface level. *This number of similar spectra beyond the modern distribution of Carya must be given serious consideration and cannot be safely attributed to far distant pollen dispersed by wind. If the pollen of Carya was deposited by wind from a long distance to the south, certainly one must explain why it is not to be found in the receptive surface peat today.*

Winchester, Wisconsin is in a region where there are atmospheric "Highs" and "Lows" passing easterly, therefore no prevailing southerly winds are present to convey large amounts of *Carya* pollen necessary to appear persistently even in small percentages in the peat. That no such pollen has been found in the surface layers, even though a search was made for it, would suggest different conditions in the past. Either the winds were more prevailingly southern or *Carya* grew nearer to the bog. Regardless of the explanation, the fact remains that *Carya* pollen has not been found in the surface peat.

The problem of wind-borne pollen and possible distant origin for fossil pollen must be considered in the light of two lines of evidence: first, that pollen may be dispersed widely, and this is supported by actual controlled studies; second, that pollen, though dispersed widely, may not enter the picture of pollen statistics and modify the spectra unduly. This is supported by the uniformity of regional pollen spectra, and by surface peat studies at least in the Middle West.

One of the most remarkable cases of wind-borne pollen is described by Erdtman (1937). In that paper, records of pollen catches made on the Atlantic Ocean show that no part of the Atlantic crossing was free from air-borne pollen. One must point out that the catches were made over water where strong westerly winds traverse the area.

Cain cites the peat work of Hansen (1943) on Orcas Island, Washington. Here was found the fossil pollen of *Abies nobilis*, *A. amabilis*, *A. lasiocarpa*, and sporadically *Tsuga mertensiana*. These species apparently do not grow upon Orcas Island today, and Hansen states that although they may have once lived there, the pollen could also have been blown from Vancouver Island or the Olympic Peninsula. Granted that the latter may be true, it must be pointed out that here is another overwater route, and that the *Abies* pollen which is the most important pollen in question, has large air sacs that are supposed to be important in dispersal. Also in that particular region there exist on-shore winds that are frequently very strong.

Another instance of wide pollen dispersal is described by Erdtman (1935) for the region of Alberta, Canada. Pine (*Pinus banksiana*) in that region contributes about 50% of the pollen in

the surface peat, though in Alberta the tree is local in its distribution. Here seems to be a case where wind-borne pollen in peat is important, and probably may be correlated with comparatively strong winds blowing southeasterly over a plains topography where forest cover is not as dense as in the Middle West.

Contrary to Erdtman's finding, surface peat studies in Douglas County in northwestern Wisconsin (Wilson, 1938) have shown a close correlation with the vegetation map of that county. This is especially apparent in the case of jack pine (*P. banksiana*) whose greatest abundance is on the sand barrens in the southeastern part of the county. When the percentages in the surface samples of ten widely spaced peat bogs were plotted upon a map and isopolls drawn between these, the center of distribution of *P. banksiana* in Douglas County became apparent at once and a very steep isopoll gradient correlated with the actual boundary of *P. banksiana.* One of the interesting features of this map is the pollen evidence of a small island of jack pine nearly forty miles northwest of the main front of the species. This evidence tends to indicate that under certain conditions the isopoll map is quite accurate and would indicate that a few percent of pollen means actual inhabitance by a species in an area. In the above case it must be pointed out that frequent winds are from Lake Superior and the pollen showers would be directed away from the area where few or no *P. banksiana* trees live.

The study of pollen deposition in bryophytic polsters (Carroll, 1943) in the Smoky Mountains was cited by Cain as an example of how pollen grains may be abundantly represented in "pollen catches" though they must come from other climaxes. This interesting study has results similar to that study by Ludi (1937) who found that valley winds lifted pollen in significant quantity some 1,100 meters. Miss Carroll found such a lift to be about 800 meters in the Smoky Mountains. This fact might suggest the presence of prevailing upslope winds so common in mountainous regions. No exact mention of areal distances is given in the paper except that some of the tree species grew several miles distant and several thousand feet lower in elevation from the polsters. The vertical distance between the living trees of *Carya* and the polster catches of *Carya* pollen is given as 2,250 feet. The observations of Miss Carroll show that *Carya*

appeared as 2.7–6.5% of the total 150 pollen grains counted, whereas the Winchester peat percentages range 0–1.5%. Only a few more percent of *Carya* pollen is present in bryophytic polsters collected within "several" miles of living *Carya* than is present in a peat sample now ninety miles north of the modern range of the nearest known *Carya*. It would seem that either more *Carya* pollen would be found in Carroll's polster samples which are only several miles from living *Carya*, or that *Carya* must have grown closer than ninety miles to the Winchester bog.

A comparison of pollen catches in mountainous and drift plain regions is dangerous if the problems of physiography, prevailing winds, and forest ecology are not appreciated. Miss Carroll has recognized the danger and states, "More contamination would perhaps take place in a mountainous region because conditions, and consequently vegetation types, change within shorter distances. In flat country, contamination would probably not be so great."

If wide dispersal of pollen by wind is a major problem in pollen statistics, it is with considerable surprise that one finds in widely distributed bogs close consistency of pollen curves. Such high regional consistency is apparent in the paper by Dr. Sears, "Types of North-American Pollen Profiles" (1935). Investigation of the bogs in northern Wisconsin and Minnesota shows a predominance of white spruce in the basal levels; above, white spruce becomes a minor element, almost replaced by pine and hardwoods such as oak, elm, basswood, maple, ash, butternut, and hickory; then, near the surface, there is a slight shift back to white spruce, a reduction in the hardwood and frequently in the pine elements. Also, at least in Wisconsin, there is an important development of hemlock which accompanies the return of white spruce. Such consistent pollen profiles would probably not be found if wind-borne pollen was very abundantly and widely transported over land surfaces, for these trees have comparatively restricted geographic ranges in the Lake Superior region. The consistent curves must be taken to indicate shifts in vegetation, and those shifts may be indicative of climatic changes. The pollen profiles agree with many other evidences (see Cooper, 1942, 1943), and suggest a more moderate climate in mid-postglacial time than now exists. If such a warmer period existed,

it is not difficult to visualize a more northern distribution for *Carya* in Wisconsin.

In conclusion, the authors wish to stress that they do not maintain that in all cases where pollen occurs in relatively small percentages in the peats are those species inhabitants of the region. They do, however, maintain that one must carefully weigh the evidence and seek to confirm or discredit the possibility. In the present case it would be just as unscientific to eliminate the possibility of a more northern range for *Carya* in Wisconsin on the basis that some pollen is wind-borne, as it would be to dogmatically ignore the possibility of distant wind-borne pollen in peat under certain conditions.

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THE PUBLICATION-DATE OF NUTTALL'S "ARKANSAS FLORA"

Robert C. Foster

In the decade following 1830, there was a noticeable rivalry between the Botanical Magazine and the Botanical Register in figuring and describing new North American plants grown from seeds sent to England by Douglas and Drummond. During this period, Nuttall published his long and important treatment of the Arkansas flora. Since there is the possibility of competition between Nuttall's work and that based on Drummond's collections, it seems desirable to establish, as exactly as possible, the publication-date of Nuttall's paper.

Nuttall's "Collections towards a Flora of the Territory of Arkansas", read before the American Philosophical Society on April 4, 1834, appeared in that Society's Transactions, vol. v. 139–203, the publication-date for the entire volume being given as 1837.

The Transactions appear to have been published in parts, each containing twenty-six four-page signatures. Nuttall's paper began on the third page of V-2K, ended on the third page of V-3A, and was certainly completely published before 1837.

In his Comp. Bot. Mag. i. 14 (Aug. 1, 1835), Hooker referred to Nuttall's work, saying "In the Transactions of the American Philosophical Society he has commenced his 'Collections towards a Flora of the Territory of Arkansas.'" Hooker noted several points, ending with a summary of the uses of *Cyamus luteus*, given on p. 160 of volume v. It is clear that, if Hooker's periodical appeared on or near the date given for its publication, at least pp. 139–160 of this volume of the Transactions had been issued some time before August 1, 1835. Sprague, in Kew Bull. 1933: 362–364, indicates that Hooker's date is substantially correct, since this portion of the Companion was issued with the August number of the Botanical Magazine.

In Bot. Mag. lxiii. t. 3465 (Feb. 1, 1836), the text accompanying the figure of *Pentstemon Cobaea* Nutt. cited the original place of publication, p. 182 of volume v. of the Transactions, this being the second page of signature 2V, the signature ending with p. 184. The relative slowness of communications at that time

makes it highly improbable that a paper published after Jan. 1, 1836, in this country, could be available for citation in England by Feb. 1, 1836, or shortly afterward.

To summarize: it seems a justifiable assumption that pp. 139–184, at least, had been issued by the end of 1835, and that the remainder, pp. 185–203, appeared in early 1836. It is beyond question that pp. 139–160 were issued by or soon after the middle of 1835. In any case, the date, 1837, usually given in citing species described in this work, is certainly incorrect.

Gray Herbarium.

The Great Smokies and the Blue Ridge.—This is a succeeding volume[1] to the "Friendly Mountains" which dealt with the climate, natural history, customs, and scenery of the White, Green, and Adirondack Mountains. Likewise this volume is designed to bring to the general reader a feeling and interest in the southern mountains. Botanically this is accomplished by three chapters contributed by Donald Culross Peattie and a chapter "Through the Year in the Great Smoky Mountains" by the park naturalist, Arthur Stupka. It was my privilege to climb LeConte in 1930 with Sharp, Cain, and Underwood, and to drive up—and especially down—the ramshackle dirt road, which at that time went no farther than Indian Gap. How the highway has changed! A modern concrete road with tunnels and turnouts has sprung up in its place. And in succeeding years I made extensive trips with Jennison—the last one into the relatively unknown Greenbrier section. So it was especially interesting to have Stupka mention the conspicuous shadbush trees (*Amelanchier*) which reach an enormous size at the summits of the mountains, occupying an altitudinal range (900–6400 ft.) greater than that of any other tree in the Smokies. Though the Great Smokies have on their summits many trees characteristic of the mountain-tops of New England, something seems strange about the trunk and bark and makes them difficult to recognize. This I believe is due to the unusually moist conditions which are encountered; the upland forests have the wet mossy look of those in Ireland or in parts of the Scandinavian Peninsula rather than of New England. The Great Smokies are not as interesting botanically as the Cumberlands to the westward, but the lesser variety of species is probably compensated by the elaborate display of azaleas and rhododendrons. Perhaps the pall of clouds which hangs over the Smokies for so much of the year tends to discourage the growth of sun-loving plants.

There is still much controversy as to the origin of balds, which occur as either grassy or ericaceous formations, and (p. 154) these are mentioned as probably due to evaporation resulting from altitude and exposure to winds. It has always seemed to me—but this is only an opinion—that the great variability in the composition of the rocks from one locality to another, even in the same ridge, may be the thing of fundamental importance.

It is easy to fall into generalizations when the only available sources are none too accurate. The many bad smells (p. 174) attributed to the vegetation of the Galapagos Islands are due—so far as I am aware—to only a single species, *Lantana pedunculata*, which thrusts the odor of naphthalene into an atmosphere already suffocatingly oppressive. But this is true only along the

[1] *The Great Smokies and the Blue Ridge.* Edited by Roderick Peattie. 384 pp., illustrated. Vanguard Press, N. Y. $3.75.

coast; as one goes inland into the forest the air is filled with the spicy fragrance of wild heliotrope. On the other hand, the Great Smokies have several plants that are more objectionable than *Lantana pedunculata.* I need only mention various species of carrion-flower belonging to the genus *Smilax,* or the purple trillium (*T. erectum*), which, in Dr. Small's Manual of the Southeastern Flora, is given the name "Stinking-Willie." Thus, on the basis of numbers of offending species, the Galapagos Islands should smell much better than the Great Smokies, but I doubt if that is actually the case.

The book is written for a popular audience and plant geography is one of the most difficult subjects to handle. On page 178, after discussing several species that have their counterparts in the Appalachians and Eastern Asia, Peattie correctly states that "in vain would you seek them in Europe or the western United States." But he also adds, "The same is true of such familiar wild flowers as jack-in-the-pulpit, Dutchman's-breeches, pipsissewa, wintergreen, shooting star, and many others. It is true too of ferns like our dainty little walking fern, the stately cinnamon fern, our maidenhair and the ostrich fern." Now it happens that all of the plants mentioned in the first sentence, with the exception of the jack-in-the-pulpit, are well-known on the Pacific Coast, and the genera represented by Dutchman's-breeches (*Dicentra*), wintergreen (*Gaultheria*), and shooting-star (*Dodecatheon*) are especially complex in that region. Pipsissewa (*Chimaphila umbellata*) has always been a well-recognized plant of Europe. As to the ferns, the maidenhair occurs from Alaska to southern California; the ostrich fern was originally described from Europe and is also on the Pacific Coast.

The book has splendid pictures of scenery and people; of these illustrations the pictures of rhododendrons facing page 186 are perhaps the most enticing, if a choice must be made.—Henry K. Svenson, Brooklyn Botanic Garden, Brooklyn, N. Y.

Does Cnicus benedictus persist in our Flora?—At various times the Blessed Thistle is reported in lists of local plants. It appears somewhat sporadically on rubbish or in cultivated ground but there is real doubt whether in the northeastern quarter of the United States it is persistent. The only New England material I can find is a series of sheets, all made up of fragments of one individual, collected by the late Walter Deane on waste ground in Cambridge, in 1885. That particular spot, long known, as dubbed by Thomas Wentworth Higginson, as the "tin cañon" was an old excavation which received much rubbish from the Harvard Botanic Garden. The plant appeared in some abundance in April, 1938, in a newly seeded clover-field near Petersburg, Virginia. In subsequent years it was not there. Is there evidence of its becoming established with us?—M. L. Fernald.

RHYNCHOSPORA, SECTION EURHYNCHOSPORA, IN CANADA, THE UNITED STATES AND THE WEST INDIES

SHIRLEY GALE

(*Continued from page 134*)

KEY TO SPECIES IN SERIES CHAPMANIAE

a. Surface of achene pricked by tiny dark pits with the exception of the smooth region of the disc, or, if the pits are obscured, the 3–4 bristles equalling the tubercle. . . .*b.*

b. Basal leaves 4–6 mm. wide, obtusely tipped, short, forming a rosette; distal portion of the midribs of at least the lower floral scales conspicuously and upwardly ciliate 13. *R. ciliaris.*

b. Basal leaves 2.5–3 mm. wide, acute, elongate, erect; floral scales not ciliate. . . .*c.*

c. Bristles 3–4, equalling the tubercle. . . . . .14. *R. solitaria.*

c. Bristles 2–3, rudimentary. . . . . .15. *R. sola.*

a. Surface of achene polished or minutely striate as the result of the crowding of small inconspicuous oblong alveoli; bristles absent or rudimentary. . . .*d.*

d. Fascicles 1–3, mostly ovoid; tubercle triangular-subulate; scales acute to aristulate. . . . . .16. *R. brachychaeta.*

d. Fascicles solitary, corymbiform; tubercle triangular to triangular-apiculate; scales with aristate tips at least 0.3 mm. long. . . .*e.*

e. Bases typically bulbous, sheathed by short fibrous acute ovate scales; floral scales silvery to reddish. . . . . .17. *R. pallida.*

e. Bases not enlarged; scales yellowish-brown to chestnut. .*f.*

f. Achenes homogeneously pale, not lustrous, 1.2–1.3 mm. wide, 1.5 mm. long; fascicles exceeded by 1–2 short, stiff bracts. . . . . .18. *R. nuda.*

f. Achenes pale except for a conspicuous dark patch at the base and apex, glossy, 0.8–1 mm. wide, 1–1.2 mm. long; fascicles exceeded by long setaceous bracts which are often somewhat circinate. . . .19. *R. Chapmanii.*

13. R. CILIARIS (Michx.) Mohr. Coarsely tufted: basal leaves short, suggesting a rosette, flat, 4–6 mm. wide, their margins and narrow keels silvery-ciliate; median and costal veins conspicuous; tips characteristically obtuse: culms terete or nearly so, stiffly erect, smooth or minutely hirsute, 3.3–8.9 dm. tall: inflorescence usually a single corymbiform to hemispherical fascicle, 1.2–2.1 cm. wide, rufous-brown, rarely accompanied by a smaller lateral fascicle on an included peduncle: spikelets ovoid, sessile, 3-flowered, 1–2-fruited, 4.5–6 mm. long: ultimate floral bracts and distal portions of the midribs of the lower scales upwardly ciliate: stamens 1–2: bristles 6, brittle, not exceeding ½ the achene in length, often rudimentary, upwardly serrulate: achene broadly elliptic, strongly lenticular, 1.5–1.6 mm. wide, 1.6–1.8 mm. long; the surface pricked by minute pits and dark

brown except for the smooth pale central disc: tubercle broadly deltoid, compressed, 0.4–0.6 mm. high, usually wrinkled and slightly encrusted by the summit of the achene. Plate 822, figs. 2A and 2B; Map 17.—Contrib. U. S. Nat. Herb. vi. 408 (1901); Small, Man. 183 (1933). *Schoenus ciliaris* Michaux, Fl. Bor.-Am. i. 36 (1803). *R. ciliata* Vahl, Enum. ii. 235 (1806); Gray, Ann. Lyc. N. Y. iii. 209, pl. 6, fig. 19[1] (1835); Chapman, Fl. So. U. S. 526 (1860); Small, Fl. 196 (1903); Britton, Trans. N. Y. Acad. Sci. xi. 90 (1892). *R. Rappiana* Small, Man. 179, 1503 (1933). *Phaeocephalum ciliatum* House, Am. Midland Nat. vi. 201 (1920).—Boggy savannas and low pinelands of the Coastal Plain from North Carolina southward throughout the peninsula of Florida and west to eastern Louisiana. North Carolina: savanna at Newport, Carteret Co., *Godfrey*, no. 5772 (G); moist black soil, low ground, Dixon, Onslow Co., *Randolph & Randolph*, no. 954 (G); pineland near Carolina Beach, New Hanover Co., *Godfrey*, no. 4699 (G); Supply Road, Southport, Brunswick Co., *Blomquist*, no. 5653 (D); pineland at Hallsboro, Columbus Co., *Godfrey*, no. 6252 (G, NC). South Carolina: grass-sedge bog or savanna, 12 miles northwest of Georgetown, Georgetown Co., *Godfrey & Tryon*, no. 747 (D, G, NY, P); grass-sedge bog or savanna, 3 miles southwest of Manning, Clarendon Co., *Godfrey & Tryon*, no. 924 (G, NY); Sumter, Sumter Co., *Bartram*, no. 3288 (P). Georgia: rather dry pine barrens, Coffee Co., *Harper*, no. 701 (G, US); intermediate pine barrens, Suwannee Lake, Ware Co., *J. S. Harper*, no. 84 (D, P); rather dry pine barrens south of Empress, Brooks Co., *Harper*, no. 1630 (G, NY, US); dry soil, Valdosta, Lowndes Co., May 27, 1940, *Sargent* (Sargent Herb.); moist pine barrens, Bullock Co., *Harper*, no. 887 (G, NY, US); pine barrens, Bethesda Church, Effingham Co., *Eyles*, no. 6106 (CU); in meadow, New England Camp, 8 miles north of Brunswick, Glynne Co., *Moldenke*, no. 5207 (NY); piney woods, Billy Island, Charleton Co., July 7, 1912, *Bradley* (P). Florida: moist pine barrens near Jacksonville, Duval Co., *Curtiss*, no. 3146 (CU, D, G, P, US); Hibernia, Clay Co., March, 1869, *Canby* (G, US); left side Palatka Road about 1 mile from florist's, Gainesville, Alachua Co., *West & Arnold*, no. 7 (CU); low pineland near swamp on road between Deland and New Smyrna, Volusia Co., Sept. 11, 1926, *Dr. Ball*[2] (NY, type of *R. Rappiana*); juxta Tomoko Creek, Volusia Co., Michaux Herb. (G, type-photo of *Schoenus ciliaris;* NY, fragment from Michx. Herb.); low pineland, vicinity of Eustis, Lake Co., *Nash*, no.

[1] Figures 18 and 19 were apparently reversed in the printing. *R. ciliata* is fig. 19, not 18 as listed.

[2] The type of *R. Rappiana*, although undoubtedly sent to Small by Rapp, and, a year later, followed up by a collection made by Rapp himself, was actually collected by Dr. Ball as stated on the memorandum attached to the sheet.

534 (CU, G, NY, P, US); in sandy field about 3 miles west of Bithlo, Orange Co., *Moldenke*, no. 201 (D, NY); low pine barren, Okeechobee region, Brevard Co., *Fredholm*, no. 5177 (G, US); on the prairie, Kissimmee Park, Osceola Co., *O'Neill*, no. 6234 (CU); flatwood east of Loughman, Polk Co., *McFarlin*, no. 4282 (CU); Tampa, Hillsborough Co., Oct., 1877, *Garber* (G, P); in water's edge, near St. Petersburg, Pinellas Co., *Deam*, no. 2904 (G); Braidentown (? Bradenton), Manatee Co., *Tracy*, no. 7126 (G, NY, US); Istokpoga Prairie between Lake Istokpoga and Kissimmee River, Highlands Co., *Small & DeWinkler*, no. 9056 (NY); in a low pineland 11 miles east of Okeechobee City, Okeechobee Co., *O'Neill*, no. 7678 (CU); Dade Co., Nov.–Dec., 1903, *Eaton* (NY); wet pine barrens, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 862a (G, NY, US). Alabama: swamp, Elberta, Baldwin Co., Aug. 21, 1926, *Wolf* (StB); common in swamp, Spring Hill, Mobile Co., *Bush*, no. 295 (NC, NY, US). Mississippi: Ocean Springs, Jackson Co., *Skehan*, no. 22632 (G); Biloxi, Harrison Co., *Tracy*, no. 6999 (G); Bay of St. Louis, Hancock Co., July 20, 1883, *Langlois* (US). Louisiana: in pine barrens, St. Tammany Parish, Sept. 14, 1892, *Langlois* (US).

Small compared his species, *R. Rappiana*, with *R. pallida* Curtis, but did not mention any possible relationship with *R. ciliaris*. However, Small's species has the short, blunt-tipped tuft of basal leaves with their silvery cilia, the ciliate bracts and scales, and the pitted, strongly lenticular achene of *R. ciliaris*. I cannot help but think that Small neglected to compare his material with the older species, as the two are unquestionably identical.

14. R. solitaria Harper. Sparingly caespitose or solitary: leaves linear, erect, flat, 2.5–3 mm. wide, smooth with blunt tips: culms terete or nearly so, slender, erect, smooth, 5.2–6.4 dm. high: inflorescence a single turbinate to subhemispherical fascicle, 1.5 cm. wide: spikelets lanceolate to fusiform, 6–7 mm. long, acuminate, sessile, 1-flowered, split open by the maturing achene: scales chestnut, with an aristate tip 0.6–0.8 mm. long: stamens 2: bristles 3–4, extremely fragile, upwardly serrulate, equalling the tubercle: achene obovate, lenticular, 1.3 mm. wide, 1.4 mm. long; the surface, with the exception of a pale smooth disc, brown and pitted: tubercle triangular-apiculate, compressed, 0.6 mm. long. Plate 822, figs 4A and 4B; Map 22.—Bull. Torr. Bot. Cl. xxviii. 468 (1901); Small, Fl. 193 (1903) and Man. 182 (1933). *Phaeocephalum solitare* House, Am. Midland Nat. vi. 202 (1920).—Southern Georgia. Georgia: moist pine bar-

rens, Tifton, Berrien Co., *Harper*, no. 668 (NY, TYPE; G, ISOTYPE) and no. 1677 (G, US).

At first glance *R. solitaria* appears very similar to *R. pallida* M. A. Curtis, but its details—the simple non-tuberous bases, blunt-tipped leaves, terete culm, chestnut spikelets, aristate scales, well developed bristles and pricked surface of the achene—indicate that it is clearly a distinct species which, so far as I am aware, is known only from collections made in the type-locality.

15. R. **sola,** sp. nov. Planta laxe caespitosa: foliis erectis valde involutis saltem siccatis 1.0–1.5 mm. latis; apicibus obtusis: culmis subteretibus, tenuibus, erectis, saepe flexilibus, 3.2–5.7 dm. altis; inflorescentia ex fasciculo uno parvo compacto turbinato vel hemisphaerico 0.8–1 cm. lato constata; bracteis obscuris fasciculum non superantibus: spiculis lanceolatis, confertis, sessilibus 2-floris, monocarpis, 5 mm. longis: squamis mucronatis, dense imbricatis castaneis: setis 2–3, rudimentariis, antrorse serrulatis: achaenio valde lenticulari-obovoideo 1.1–1.2 mm. lato 1.2–1.6 mm. longo foveolato fusco; disco medio pallido: tuberculo compresso-deltoideo. PLATE 820, FIGS. 1A and 1B; MAP 21.—*R. fascicularis* sensu C. Wright in Sauvalle, Anal. Acad. Ci. Habana, viii. 84 (1871) and Fl. Cub. 180 (1873), in part; non (Michx.) Vahl. *R. distans* sensu Grisebach, Cat. Pl. Cub. 243 (1866), non (Michx.) Vahl.—Low pinelands of western Cuba. CUBA: pinales, Hato Quemado, Pinar del Rio, Nov. 20, 1862?,[1] and San Juan-Guanes, *Wright*, no. 3397, sheet labeled B (G, in part); *Wright*, no. 3397, sheet labeled A (G, TYPE); *Wright*, no. 3399 sheet labeled A (NY, in part)[2]; *Wright*, no. 3397, in Herb. Canby, no. 396 (US, in part); low savannas, Chirigota, Pinar del Rio, Oct. 26, 1863?,[3] Wright, no. 3399 (US, in part); Sabana de la Maguina, south of Pinar del Rio City, Pinar del Rio, November 28, 1940, *Léon & Alain*, no. 19422 (G).

With the exception of the Léon & Alain collection, no. 19422, *R. sola* is known only from specimens collected by Charles Wright and distributed as *R. distans* no. 3397 and *R. deflexa* Gris. no. 3399. I have seen 3 sheets of no. 3397; of the two located at the Gray Herbarium, one contains specimens of *R. sola* exclusively; this I am designating as the TYPE. The other sheet is mixed, containing on the left a specimen of *R. fascicularis* (Michx.) Vahl, var. *typica*. Sheet no. 3397 from the Canby

[1] See Underwood, Bull. Torr. Bot. Cl. xxxii. 297 (1905). Underwood misread "Quemado" as "Queniando."

[2] See footnote to *Wright*, no. 3399 under *R. fascicularis* (Michx.) Vahl.

[3] See Underwood. Bull. Torr. Bot. Cl. xxxii. 297 (1905).

Herbarium, now at the National Museum, is even more confusing. The specimen on the left is *R. sola*, that in the center, accompanied by two inflorescences, is *R. fascicularis* and that on the far right, *R. Wrightiana* Boeckl. A single sheet, no. 3399, from the Herbarium of the New York Botanic Garden contains a specimen of *R. sola*, located centrally and accompanied, right and left, by specimens of *R. fascicularis* to which the label *R. deflexa* pertains.

Although it is evident that the original distributor failed to distinguish between *R. sola* and *R. fascicularis*, these two species are not of the same series, and, once several important details have been observed, can be rather easily distinguished. As stated in the description, the leaves of *R. sola* end in a relatively abrupt blunt tip; and the slender culm bears, without exception, a single terminal fascicle which is subtended by inconspicuous bracts not exceeding the fascicle in height. The leaf-tips of *R. fascicularis* are triquetrous and attenuated; the culm usually bears one or more distant lateral fascicles, and the terminal fascicle is exceeded by a bract approximating twice the height of the fascicle. Occasionally young or reduced plants of *R. fascicularis* bear but a solitary terminal fascicle, but in all cases the spikelets remain divergent and ovoid in shape, not mainly ascending and ovate-lanceolate as those of *R. sola*.

Less obvious differences between the species are supplied by the details of the achenes. That of *R. sola* is obovoid, extremely lenticular, with a puncticulate surface, and accompanied by 2–3 rudimentary bristles. The achene of *R. fascicularis*, on the contrary, is subelliptic to suborbicular, markedly biconvex, with a smooth surface, and accompanied by six bristles varying in height from ½ the achene to exceeding the tubercle.

The natural affinities of *R. sola* lie, not with *R. fascicularis*, but with the very rare continental species, *R. solitaria* Harper, which is known only from its type-locality in Berrien County, Georgia. Although larger in all its parts than *R. sola*, this species also has obtusely tipped (but wider) leaves, a slender culm, and a single terminal fascicle. However, the lanceolate-acuminate to fusiform spikelets of *R. solitaria*, measuring 6–7 mm. long, are easily distinguished from the ovate-lanceolate (4–5 mm. long) spikelets of *R. sola*. The achenes again emphasize the close

relationship existing between the two species, for they are identical in both shape and surface-sculpturing, differing only in size, color, and the relative development of bristles.

The name, *R. sola*, has been selected because this species is closely related to *R. solitaria* and shares its characteristic feature of bearing only one fascicle.

16. R. BRACHYCHAETA (by error appearing as *brachychata*) C. Wright. Caespitose: leaves filiform, promptly involute, ascending, smooth except for the sparingly serrulate upper margins: culm terete or nearly so, filiform, wiry, flexuous, smooth, 3.5–5.2 dm. high: inflorescence of 1–3 remote fascicles, 0.6–1.2 cm. wide, usually oblong in outline to approaching corymbiform: spikelets fusiform and sterile, or ovoid, acute and fertile, 1-flowered, 3 mm. long: scales acute to aristulate, drab-chestnut: bristles 1–2, rudimentary: achene broadly obovoid, with a pale central disc, smooth or faintly cancellate, 0.9–1.1 mm. wide, 1.2 mm. long: tubercle subulate, 0.4 mm. long, with a broad base. PLATE 822, FIGS. 1A and 1B; MAP 20.—C. Wright in Sauvalle, Anal. Acad. Ci. Habana, viii. 85 (1871) and Fl. Cub. 180 (1873), as "*brachychata*"; Britton, Trans. N. Y. Acad. xi. 90 (1892), in part. *R. pallida* sensu Clarke in Urban, Symb. Ant. ii. 126 (1900), in part, non M. A. Curtis; sensu Kükenthal, Fedde, Rep. Spec. Nov. xxiii. 209 (1926), in part, non M. A. Curtis. *R. Chapmanii* sensu Britton, Mem. Soc. Cubana Hist. Nat. ii. 194 (1916), non M. A. Curtis. *R. Blauneri* Britton, Bull. Torr. Bot. Cl. l. 56 (1923). *Phaeocephalum brachychaetum* House, Am. Midland Nat. vi. 201 (1920).—Fresh-water shallows of western Cuba, Dominican Republic and eastern Puerto Rico. CUBA: in occasionally flooded places in pinelands south of railroad, Herradura, Pinar del Rio, *Ekman*, no. 17737 (G); "en sabanas bajas y a arillas de lagunas, jurisdiccion de Pinar del Rio,"[1] *Wright*, no. 3782 (G, TYPE; NY, US, probable ISOTYPES). HISPANIOLA: hard soil, shallow water, Laguna Ahoga-los-perros, Sabana Guabatico, prov. Santo Domingo, Llano Costero, Dominican Republic, *Ekman*, no. 13309 (US). PUERTO RICO: Sierra Luquillo, *Blauner*, no. 247 (NY, type of *R. Blauneri* Britton).

In his list of North American Rhynchospora, published in 1892, Britton recognized *R. brachychaeta* C. Wright, attributing it to Sauvalle. However, that Britton's conception of this species was at best uncertain is seen in his synonyms "*R. gracillima* Sauv." and "*R. fascicularis* var. *stenophylla* Chapm. mss." *R. gracillima* Wright in Sauvalle, I am recognizing under its

[1] Wright in Sauvalle, Fl. Cub. 181 (1873).

legitimate name, *R. Wrightiana* Boeckl.; *R. fascicularis* var. *stenophylla* was later authentically published by Chapman as *R. stenophylla* and has been maintained as such. Keeping this confusion of 3 species in mind, one is not surprised to find that Britton, in 1916, revised his earlier opinion, this time referring *R. brachychaeta* to *R. Chapmanii* Curtis.

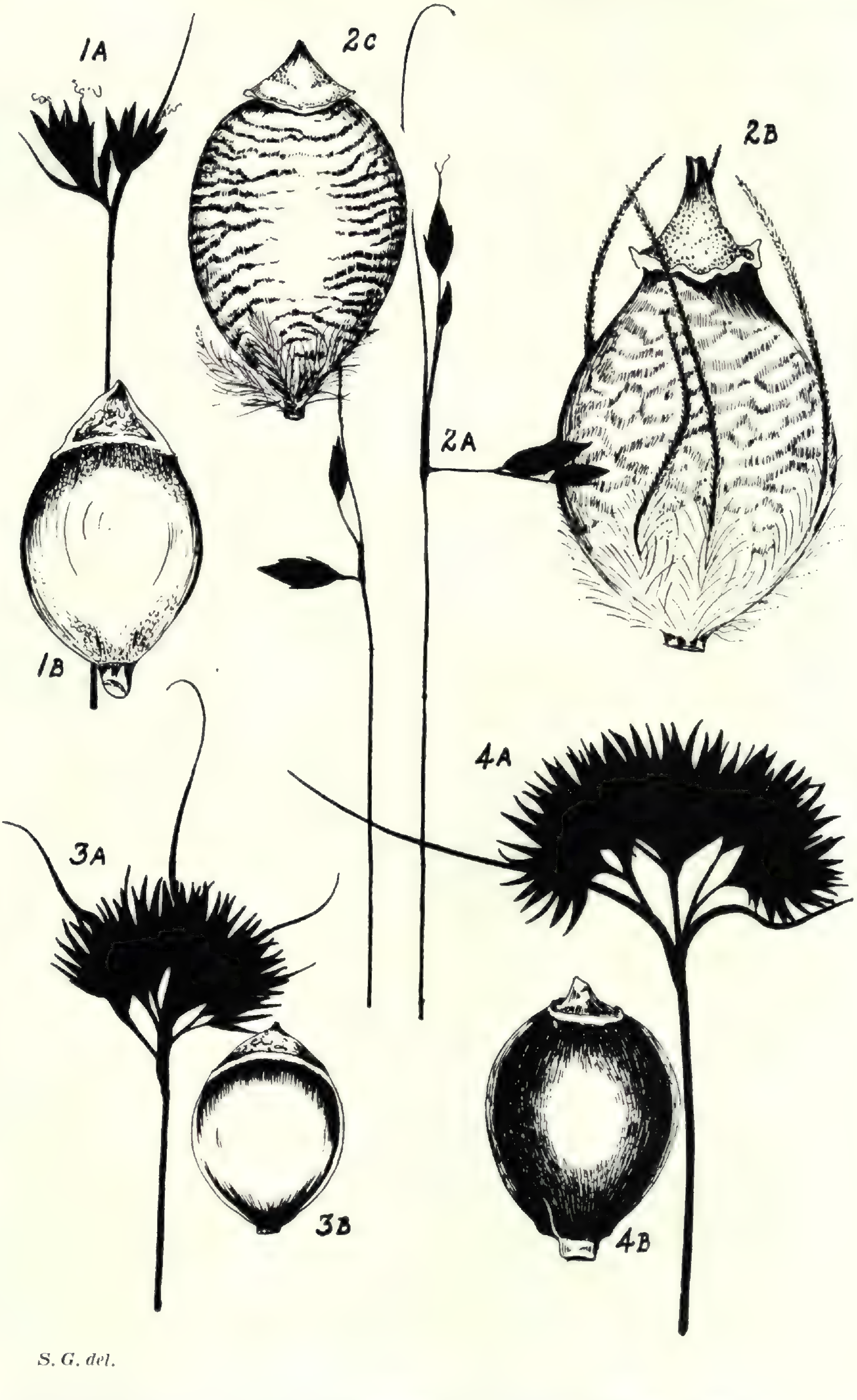
Superficially *R. brachychaeta* and *R. Chapmanii* have much in common. The former is readily distinguished, however, by its acute, not long-aristate, spikelets, and its inflorescence consisting of 1–3 remote narrowly elliptic fascicles in contrast to the single terminal corymbs of *R. Chapmanii.* Close observation by means of a lens enables one to distinguish the two species on a basis of their achenes as well. The achene of *R. brachychaeta* is obovate, dull, with a pale central disc, with a subulate tubercle and with rudimentary bristles. The achene of *R. Chapmanii*, on the contrary, is subelliptic, the disc so enlarged as to cover the entire surface with the exception of a small dark patch at the base and the apex. The surface is glossy, the tubercle deltoid-apiculate, and the bristles are lacking. Clarke, on the other hand, lists *R. brachychaeta* in the synonymy of *R. pallida* M. A. Curtis; but Blauner no. 247 bears Clark's annotation "*Rynchospora divergens* Curtis!"

In 1922, Britton, studying the same specimen, Blauner no. 247, realized that it was a good species wrongly annotated by Clarke; but, failing to see its connection with Wright's *R. brachychaeta,* set it up as a new species, *R. Blauneri.*

The confusion of *R. brachychaeta* with *R. pallida,* initiated by Clarke, was furthered by Kükenthal who, in 1926, assigned Wright, nos. 3782 and 3397 to the latter species. No. 3397 at the Gray Herbarium is a mixed sheet, containing on the left a specimen of *R. fascicularis* (Michx.) Vahl, and it suggests the possibility that the sheets seen by Kükenthal are also mixed. However, even if this were so, it is quite improbable that the specimens of either sheet are *R. pallida,* since this species, unmistakable in its larger achene, pale corymb and tuberous bases, has not been reported south of the Carolinas.

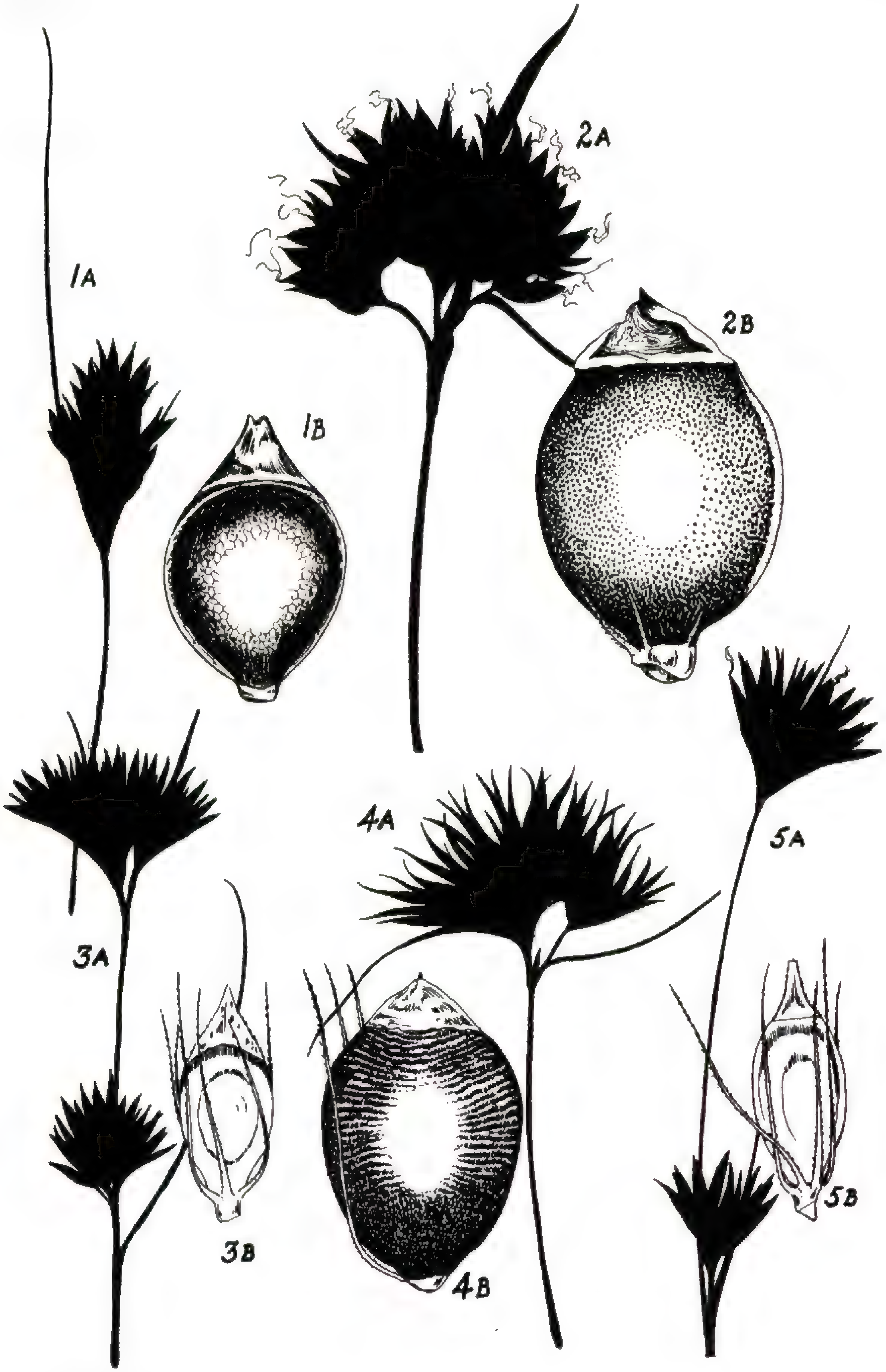
I have corrected the original spelling of this name, following the precedent of authors since Wright.

17. R. pallida M. A. Curtis. Caespitose with short stolons; base bulbous, sheathed by fibrous, acute, ovate scales: leaves long, narrowly linear, 1–3 mm. wide, erect, flat with the exception of the triquetrous tip; upper margins upwardly scabrous: culms acutely trigonous, slender, flexuous, 4.4–9.4 dm. tall, upper angles sparingly serrulate: inflorescence a single turbinate to hemispherical fascicle, 1.4–2.6 cm. wide: spikelets ovoid-attenuate, 4.5–5 mm. long, sessile, 1-flowered: scales forced apart by the developing achene, with aristate tips 0.3–0.4 mm. long, silvery, pale to reddish: stamens 2: bristles obsolete or 1–3 rudimentary stubs 0.2 mm. long: achene obovate to broadly elliptic in outline, strongly lenticular, the surface finely striate, the umbo light and the marginal regions chestnut-brown, 1.2–1.5 mm. wide, 1.4–1.8 mm. long: tubercle compressed, deltoid-apiculate, 0.2–0.4 mm. high. Plate 821, figs. 4A and 4B; Map 18.—Am. Journ. Sci. ser. 2. vii. 409 (1849), non (Nees) Steud.; Chapman, Fl. So. U. S. 527 (1860); Gray, Man. ed. 5: 568 (1867); Britton & Brown, Ill. Fl. i. 277, fig. 649 (1896); Britton, Man. 184 (1901); Small, Fl. 194 (1903) and Man. 179 (1933); Robinson & Fernald in Gray, Man. ed. 7: 200, fig. 322 (1908); Fernald, Rhodora, xlii. 378, map 14, and 381 (1940). *R. Curtisii* Steudel, Cyp. 141 (1855); Boeckeler, Linnaea, xxxvii. 564 (1873); non Britton ex Small. *Phaeocephalum pallidum* House, Am. Midland Nat. vi. 202 (1920).—Open bogs and wet depressions, often in pineland, Long Island, New York, south through North Carolina. New York: pine-barren swamp, Central Islip, Suffolk Co., *Ferguson*, no. 515 (G, NY). New Jersey: near P. R. R. 1½ miles northwest of Allaire, Monmouth Co., *Van Pelt & Brown*, no. 244 (P); Lawrence Station, Mercer Co., Aug. 6, 1885, *Peters* (P); growing in dense tufts, Tom's River, Ocean Co., *Parker* (G); sandy peaty edge of cedar swamp, Roberts Branch, Batsto River, Hampton Gate, Burlington Co., *Fogg*, no. 4795 (CU, NY, P); swamp near Merchantville, Camden Co., Sept. 9, 1866, *Parker* (G, P); Woodbury, Gloucester Co., *Herb. C. E. Smith* (P); Mays Landing, Atlantic Co., *Pennell*, no. 8166 (NY); northwest along Port Norris Trolley, Dividing Creek, Cumberland Co., *Long*, no. 4835 (P); boggy meadow, Swain, Cape May Co., Aug. 8, 1925, *Stone* (G). Delaware: pine-barren bogs near Laurel, Sussex Co., Aug. 19, 1880, *Commons* (NY, P). Maryland: swamps, Eastern Shore, near Salisbury, Wicomico Co., Sept., *Canby* (US). Virginia: sphagnous savanna-like swale east of Cherry Grove, south of South Quay, Nansemond Co., *Fernald & Long*, no. 10550 (CU, G, P, NY). North Carolina: wet depression, pineland, beside railroad, 1 mile east of Bailey, Nash Co., *Oosting*, no. 1677 (CU); damp or peaty sandy soil, 3 miles west of Sims, Wilson Co., *Wiegand & Manning*, no. 613 (G); savanna 8 miles southwest of Washington, Beaufort Co.,



S. G. del.

Rhynchospora nuda: fig. 1A, inflorescence, × 2; fig. 1B, achene, × 20.
R. oligantha, var. typica: fig. 2A, inflorescence, × 2; fig. 2B, achene, × 20.
R. oligantha, var. breviseta: fig. 2C, achene, × 20.
R. Chapmanii: fig. 3A, inflorescence, × 2; fig. 3B, achene, × 20.
R. pallida: fig. 4A, inflorescence, × 2; fig. 4B, achene, × 20.



RHYNCHOSPORA BRACHYCHAETA: FIG. 1A, portion of inflorescence, × 2; FIG. 1B, achene, × 20.
R. CILIARIS: FIG. 2A, inflorescence, × 2; FIG. 2B, achene, × 20.
R. FILIFOLIA: FIG. 3A, inflorescence, × 2; FIG. 3B, achene, × 20.
R. SOLITARIA: FIG. 4A, inflorescence, × 2; FIG. 4B, achene, × 20.
R. FUSCOIDES: FIG. 5A, inflorescence, × 2; FIG. 5B, achene, × 20.

Godfrey, no. 4393 (G); wet soil, open pinelands, Newport, Carteret Co., *Randolph & Randolph*, no. 925 (G); moist sandy soil, Fayetteville, Cumberland Co., Biltmore Herb., no. 4472c (US); low pineland, 15 miles north of Laurenburg, Scotland Co., *Godfrey*, no. 5055 (G); wet sandy soil, north side, White Lake, Bladen Co., *Blomquist*, no. 10862 (D); Burgaw, Pender Co., Aug. 1879, *Hyams* (US); low grounds near Wilmington, New Hanover Co., *Biltmore Herb.*, no. 4472 (NC).

18. R. **nuda,** sp. nov. Planta caespitosa: foliis filiformibus vel 1.5 mm. latis, planis, saepissime laevibus, laxe ascendentibus: culmis subtriquetris gracilibus ascendentibus, apicem versus flexilibus vel laxis, 3–4.3 dm. altis: fasciculo solitario, compacto subhemisphaerico vel turbinato, 0.5–1 cm. lato: bracteis setaceis quam fasciculo paullo longioribus: spiculis fertilibus lanceo-ovoideis 4 mm. longis: spiculis sterilibus fusiformibus et numerosis, confertis ascendentibus sessilibus: squamis dense imbricatis, pallidis; mucrone prominente 0.4 mm. longo: setis nullis vel rare 1 rudimentaria antrorse serrulata: achaenio obovoideo lenticulari leviter biconvexo 1.2–1.3 mm. lato 1.5 mm. longo, laevi pallido opaco: tuberculo compresso-deltoideo, apiculato 0.4 mm. alto. Plate 821, figs. 1A and 1B; Map 23.—Moist sand, Isle of Pines. Cuba: moist white sand, vicinity of Los Indios, Isle of Pines, Feb. 13, 1916, *Britton, Britton & Wilson*, no. 15809 (NY, type) and no. 14177 (NY); in a wet palm grove of *Colpothrinax Wrightii*, between Nueva Gerona and McKinley, Isle of Pines, Feb. 23, 1939, *León, Victorin & Carabia*, no. 18770 (CU); sandy savanna between Nueva Gerona and McKinley, Isle of Pines, Feb. 23, 1939, *León, Victorin & Carabia*, no. 18757 (CU, in part).

This West Indian species is known to me only from three specimens collected on the Isle of Pines. It is similar to *R. Chapmanii* M. A. Curtis both in the slender habit and details of the inflorescence—the numerous fusiform sterile spikelets, strongly awned scales, ovoid, lenticular, bristleless achenes. It differs from the latter in having stiffly erect, not circinate bracts and larger fertile spikelets which are not forced open by the growing achene and which are few in number so that the resultant fascicles are smaller and less corymbiform than those of *R. Chapmanii*.

R. nuda also differs from *R. Chapmanii* in details of the achene. That of the latter measures 0.8–1 mm. wide, 1–1.2 mm. long, is typically lustrous, pale, with dark brown patch at the base and apex. The achene of the Cuban species, on the other hand, is 1.2–1.3 mm. wide, 1.5 mm. long, with a uniformly pale dull surface.

The only close relative of *R. nuda* on the islands is *R. brachychaeta* Wright. However, the terminal fascicles of the latter, although similarly characterized by sterile fusiform spikelets, are occasionally accompanied by 1 or 2 smaller lateral fascicles. Moreover, the scales of *R. brachychaeta* are acute, or, at the most, aristulate, in contrast with the strongly aristate scales of *R. nuda;* and the achenes of the former are smaller (0.9–1.1 mm. wide, 1.2 mm. long), dark brown relieved by a large pale disc and usually accompanied by 1–2 rudimentary bristles.

The specific name has been chosen with reference to the almost complete failure of the bristles, an uncommon condition in the Section *Eurhynchospora.*

19. R. Chapmanii M. A. Curtis. Densely caespitose: leaves capillary to 1 mm. wide, flat, becoming involute on drying; upper margins finely serrulate: culms obtusely trigonous, slender, wiry, erect, smooth, 3–5.1 dm. high: inflorescence a single terminal corymbiform fascicle, 0.5–1.7 cm. wide, closely compacted, less often slightly exceeded by a smaller secondary fascicle: bracts several, filiform, exceeding the fascicles, erect or slightly circinate: fertile spikelets slenderly ovoid-aristate, mostly ascending, closely approximate, 1-flowered, split apart by the maturing achene, 2.5–3 mm. long; sterile spikelets fusiform: scales with aristate tips 0.4–0.6 mm. long, pale chestnut-brown: stamens 1–2: bristles none: achene subelliptic in outline, strongly lenticular, 0.8–1 mm. wide, 1–1.2 mm. long, pale except for the dark brown patch at base and apex; surface obscurely rugulose to smooth, glossy: tubercle deltoid-apiculate with a broad base, compressed, 0.2–0.3 mm. high. Plate 821, figs. 3A and 3B; Map 19.—Am. Journ. Sci. ser. 2. vii. 409 (1849); Chapman, Fl. So. U. S. 528 (1860); Small, Fl. 194 (1903) and Man. 179 (1933). *R. conferta* Chapman ex M. A. Curtis, Am. Journ. Sci. ser. 2. vii. 409 (1849), in syn. of *R. Chapmanii.* *R. Grayana* Chapman ex M. A. Curtis, Am. Journ. Sci. ser. 2. vii. 409 (1849), pub. in syn. of *R. Chapmanii.* *Phaeocephalum Chapmanii* House, Am. Midland Nat. vi. 201 (1920).—Low, sandy pineland of the Coastal Plain of North Carolina to Florida and west to eastern Louisiana. North Carolina: wet sandy soil, waste ground, Beaufort, Carteret Co., *Randolph & Randolph,* no. 795 (G); savanna, 8 miles south of Jacksonville, Onslow Co., *Godfrey,* no. 6472 (G); 7 miles southwest of Wilmington, Brunswick Co., *Godfrey,* no. 6220 (G); moist place, Pireway, Columbus Co., *Schallert,* no. 3973 (US); low pineland near White Lake, Bladen Co., *Blomquist,* no. 5617 (D); pineland at Delway, Sampson Co., *Godfrey,* no. 6170 (D, G); low pineland at Dunn, Harnett Co., *Godfrey,*

no. 6139 (D, G). South Carolina: grass-sedge bog or savanna, 18 miles north of Georgetown, Georgetown Co., *Godfrey & Tryon*, no. 1609 (D, G, NY); damp pine levee, Santee Canal, Berkeley Co., *Ravenel*, no. 25 (G); grass-sedge bog or savanna 14 miles south of Monks Corner, Berkeley Co., *Godfrey & Tryon*, no. 1432 (G, NY); pineland pool, 5 miles south of Hardeeville, Beaufort Co., *Eyles*, no. 4378 (CU). Georgia: moist pine barren near Monteith, Chatham Co., *Eyles*, no. 6455 (CU); sandy borders of pine-barren stream, Fitzgerald, Ben Hill Co., *Harper*, no. 1420 (G, NY, US); moist pine barrens, Sweetwater Creek, Clinch Co., *Eyles*, no. 244 (D). Florida: moist pine barrens near Jacksonville, Duval Co., *Curtiss*, no. 5015 (G, NY, US); Tocai, St. Johns Co., *Palmer*, no. 605 (G); Tampa, Hillsborough Co., Oct., 1877, *Garber* (G, P); prairie, 18 miles east of Okeechobee City, St. Lucie Co., *Small et al.*, no. 9300 (NY); edge of dried-up pool in low pineland, vicinity of Eustis, Lake Co., *Nash*, no. 1396 (NY); turfy, boggy, sandy meadow, 7 miles west of Sneads, Jackson Co., *Wiegand & Manning*, no. 589 (G); sloping moist pine barrens about 5 miles south of Bristol, Liberty Co., *Harper*, no. 47 (G, NY, P); flat pine barrens, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 201a (G, NY, US); low open places, Lynn Haven, Bay Co., Oct. 12, 1921, *Billington* (US). Alabama: low pineland about Miflin Creek, Elberta, Baldwin Co., July 9, 1926, *Wolf* (StB); sandy pineland, Theodore, Mobile Co., *Pennell*, no. 4446 (NY). Mississippi: Ocean Springs, Jackson Co., *Seymour*, no. 15 (CU, D, NY, US); Biloxi, Harrison Co., *Tracy*, no. 4888 (US). Louisiana: open pineland, 1 mile north of Abita Springs, St. Tammany Parish, *Pennell*, no. 4167 (NY).

Series 4. **Fuscae** (Clarke), stat. nov. et emend. Represented in the peat bogs of the northeast by the common *R. fusca*, also infrequent species in low places and pond-margins of the Coastal Plain and Cuba. Habit solitary to caespitose: leaves filiform to 2 mm. wide: culms filiform to slender: inflorescence 2–4 turbinate to hemispherical fascicles: spikelets maturing several achenes: scales loosely imbricate, castaneous to fuscous: bristles upwardly serrulate, well developed: achenes pyriform, slenderly elliptic, often strongly biconvex, smooth to glossy (minutely granular in *R. fuscoides*): tubercle triangular, compressed, thickly setose.—*Rhynchospora* Series B. *Diplostyleae* Sect. 4. *Fuscae* Clarke in Urban, Symb. Ant. ii. 105 (1900), in part. *Rhynchospora* V. *Glomeratae* Small, Man. 175 (1933), in small part.

Key to Species in Series Fuscae

a. Fascicles 1–3, turbinate or ovoid, the relatively few spikelets strongly ascending; leaves filiform to 1.5 mm. wide, erect. . . . *b.*

b. Slenderly stoloniferous; fascicles exceeded by 1–2 long bracts; bristles naked at their bases . . . . 20. *R. fusca.*

b. Caesptose; bracts shorter than or barely exceeding the fascicles; bristles sparsely hairy at their bases. . . .*c.*
c. Achenes plumply ovoid, homogeneously brown, 1–1.1 mm. long. . . . . .21. *R. pleiantha.*
c. Achenes slenderly elliptic, with a pale oval disc, 1.3–1.5 mm. long. . . . . .22. *R. Curtissii.*
a. Fascicles corymbose to hemispherical, composed of many erect to divaricate spikelets, or, if fascicles more or less turbinate, then 4–5 in number, with many spikelets and the leaves 2 mm. wide or wider and languidly ascending. . . .*d.*
d. Corymbs 2, rarely 3, the terminal internode strongly arched; bracts foliaceous. . . . . .23. *R. Harperi*
d. Corymbs 2–5, the terminal internode erect or flexuous; bracts setaceous. . . .*e.*
e. Achenes borne on a persistent basal stipe which is 6 mm. in length and covered with a tangle of white hairs; habit weak; leaves 2 mm. wide or wider; corymbs 4–5 24. *R. crinipes.*
e. Achene without a conspicuous basal stipe; stipe, if, present, not hairy; habit wiry, erect; leaves filiform to 1.5 mm. wide; corymbs 2–4. . . .*f.*
f. Surface of achenes glassy, with a white lustrous disc; leaves filiform, rarely 2 mm. wide; Coastal Plain, and western and central Cuba. . . . . .25. *R. filifolia.*
f. Surface of achene tending to become granular or somewhat polished, cinnamon-brown with a paler central disc; leaves 1–1.5 mm. wide; range limited to western Cuba. . . . . .26. *R. fuscoides.*

20. R. FUSCA (L.) Ait. f. Slenderly stoloniferous: leaves promptly involute, filiform to 1.5 mm. wide, ascending: culms slender, erect, terete, 0.8–4.6 dm. high: terminal fascicle often compounded of 2–3 closely approximated secondary fascicles, turbinate or ovoid, 0.3–2 cm, wide, exceeded by the 1 or 2 long circinate or erect bracts; lateral fascicles 1–2, on exserted peduncles: spikelets narrowly ellipsoid, 2–3-flowered, 2–3-fruited, loose, sessile, strongly ascending, 4–6 mm. long: scales aristate, castaneous, sometimes blackened: bristles 5–6, 3 always as long as or longer than the tubercle, 2–3 often shorter than the achene, delicate, tenuous, upwardly serrulate, sinuously ascending: achene pyriform, lenticular but plump, obscurely marginate, smooth, lustrous, light brown, occasionally marked with a faint reticulate pattern, 1–1.1 mm. wide, 1.2–1.3 mm. long: tubercle attenuate-subulate, usually greenish; the lower margins conspicuously serrulate. PLATE 824, FIGS. 2A and 2B; MAP 24.—Hort. Kew. ed. 2: i. 127 (1810); Gray, Ann. Lyc. N. Y. iii. 215, pl. 6, fig. 26 (1835); Torrey, Ann. Lyc. N. Y. iii. 366 (1836); Britton & Brown, Ill. Fl. i. 279, fig. 656 (1896); Britton, Man. 185 (1901); Small, Fl. 1321 (1903) and Man. 181 (1933); Robinson & Fernald in Gray, Man. ed. 7: 200, fig. 319 (1908); Victorin, Fl. Laurent. 689, fig. 248 (1935). *Schoenus fuscus* Linnaeus, Sp. Pl. ed. 2: ii. 1664 (1763). *R. alba* β. *fusca* Vahl, Enum. ii. 236 (1806). *Phaeocephalum fuscum* House, Am. Midland Nat. vi. 202 (1920).

—Peat bogs and sandy or peaty pond-shores, Newfoundland, eastern New Brunswick, Nova Scotia and southern portions of Maine, New Hampshire and Vermont; general over the other New England states; southward along the coast to Maryland; inland in central New York State with scattered stations on the shores of Lakes Superior, Michigan and Huron; also in Europe. The characters of *R. fusca* are sufficiently distinct to make the citation of representative specimens unnecessary.

21. R. **pleiantha** (Kük.), stat. nov. Caespitose: leaves filiform to 1 mm. wide, flat, setaceous, ascending: culms obtusely trigonous, filiform to slender, erect, exceeding the radical leaves, 2.5–4 dm. tall: terminal fascicle corymbiform, composed of not more than 15 spikelets; lateral fascicles 1–2, smaller, on exserted erect peduncles: spikelets oblong-ovate, sessile, erect to spreading, approximately 6-flowered, 2-fruited, 6 mm. in length: fertile scales lanceolate-aristate, loosely imbricate, greatly exceeding the achene in length: bristles 6, variable, the tallest barely exceeding to twice the height of the tubercle, upwardly serrulate, with a few short white hairs at their bases: achene ovate, lenticular, biconvex, with depressed margins, 0.7–0.8 mm. wide, 1–1.1 mm. long; surface smooth, dark shining brown at maturity, with an indefinite paler disc: tubercle triangular, attenuate, flat, pale; margins sparingly serrulate or smooth, 0.6–0.8 mm. long. PLATE 823, FIGS. 4A and 4B; MAP 25.—*R. filifolia* Torrey var. *pleiantha* Kükenthal, Fedde Rep. Spec. Nov. xxiii. 208 (1926). *R. fusca* sensu Harper, Bull. Torr. Bot. Cl. xxx. 324 (1903), non (L.) Ait. f.—Infrequent, shores of ponds and lakes in southeastern North Carolina, southwestern Georgia, central Florida, and western Cuba. NORTH CAROLINA: shore of Silver Lake near Wilmington, New Hanover Co., July 5, 1938, *Godfrey*, no. 4846 (G); shallow pond near Carolina Beach, New Hanover Co., July 2, 1938, *Godfrey*, no. 4827 (G); moist sandy soil, Orton, Brunswick Co., Aug. 18, 1930, *Blomquist* (D.) GEORGIA: margin of pine-barren pond near Rift, Lee Co., July 13, 1901, *Harper*, no. 1067 (G, NY). FLORIDA: sandy shore of Lake Juana, Eustis, Lake Co., July 16–31, 1894, *Nash*, no. 1321 (G, NY, P, US). CUBA: on moist white sand on shore of the laguna, Laguna Santa Maria, Pinar del Rio, Aug. 22, 1923, *Ekman*, no. 17242a (NY, US, immature. This number cited by Kükenthal in original description of var. *pleiantha*) and no. 17242b (G. This number cited by Kükenthal in original description of var. *pleiantha*.).

Specimens of *R. pleiantha* have generally been identified as either *R. Curtissii* Britt. ex Small or *R. fusca* (L.) Ait. f. The confusion with *R. Curtissii* obviously results from a similarity in habit, but the most superficial examination of the achenes enables one to separate these species. Those of *R. pleiantha* are

pyriform, dark brown, not exceeding 1 mm. in length; those of *R. Curtissii*, on the other hand, are narrowly ellipsoidal, 1.3–1.5 mm. long and light brown, with a pale conspicuous oval disc.

The confusion of *R. pleiantha* with *R. fusca*, however, is due to a likeness which extends to details, not only of the habit and spikelet, but to the achene as well. Nevertheless, specimens of *R. pleiantha* can rather easily be separated from those of *R. fusca*, for the fascicles of the latter are exceeded by a long setaceous bract which is often circinate at its tip; whereas those of the southern species are subtended by a short stiff bract which is at the most only twice the height of its facsicle.

The specific distinction of the one from the other species rests, however, on the more technical differences of the achene. That of *R. pleiantha* is 0.7–0.8 mm. wide and 1 mm. long; in color it is a dark mahogany-brown, and the bristles are sparsely plumose at their bases. The achene of *R. fusca*, by contrast, is larger, 1–1.1 mm. wide and 1.2–1.3 mm. long, consistently light brown in color, with the bases of the bristles naked.

23. R. Curtissii Britt. ex Small. Caespitose: leaves filiform to 1 mm. wide, wiry, involute with the exception of the flattened tip 0.6–1.4 mm. long: culms filiform, loosely ascending, 1.5–3 dm. high: fascicles 1–2, turbinate, 4–8 mm. wide, composed of less than 10 spikelets; lateral fascicle borne on an included peduncle: spikelets ovoid-elliptic to fusiform, similar to those of *R. fusca*, 2–3-flowered, 2–3-fruited, strongly ascending, 4–6 mm. long: scales mucronulate, ovate-oblong, rather loose, castaneous: bristles 6, erect, delicate, tenuous, scarcely equalling to well exceeding the tubercle, antrorsely hispidulous, sparingly plumose at the base: achene narrowly ellipsoid, lenticular, smooth, often lustrous, light brown, with a pale elliptic disc, marginate, 0.6–0.7 mm. wide, 1.3–1.5 mm. long: tubercle deltoid, sometimes subulate, compressed, with conspicuous upward serrulations, 0.8–1.2 mm. long. Plate 823, figs. 3A and 3B, Map 26.—Fl. 195, 1327 (1903) and Man. 181 (1933). *R. fusca* sensu Fernald, Bot. Gaz. xxiv. 433 (1897), non (L.) Ait. f. *Phaeocephalum Curtissii* House, Am. Midland Nat. vi. 201 (1920).—Low places, coastal counties of Northwestern Florida, Alabama, and Mississippi. Florida: moist roadside, Milton, Santa Rosa Co., *Curtiss*, no. 5929 (NY, type; G, NC, US, isotypes); moist pine barrens about 1½ miles northeast of Milton, Santa Rosa Co., *Harper*, no. 46 (G, NY, US). Alabama: swamp, Elberta, Baldwin Co., Aug. 21, 1926, *Wolf* (StB, in part *R. filifolia* Gray in Torr.). Mississippi: Ocean Springs, Jackson Co., *Tracy*, no. 4891 (G, NC, NY, US).

23. R. Harperi Small. Solitary: radical leaves filiform, few, short; cauline leaves 1–1.5 mm. wide, long-attenuate, erect, canaliculate, smooth: culm obtusely trigonous, slender, 6–7.3 dm. tall; the terminal internode strongly arched: fascicles 1–2, rarely 3, corymbiform, 1.1–1.5 cm. wide, separated by the arching internode; occasionally a third fascicle distant and smaller: bracts foliaceous: spikelets ovoid, loosely imbricate, 5-flowered, 4-fruited, 5–5.6 mm. long: scales aristulate, margins free, castaneous: bristles 6, slender, upwardly hispidulous, falling short of the tubercle: achene obovate to pyriform, strongly umbonate, brown, with a slightly paler disc, smooth, 1–1.1 mm. wide, 1.3–1.4 mm. long: tubercle subulate, pale, 0.6–0.9 mm. high, its margins thickly hispidulous. Plate 823, figs. 1A and 1B; Map 27.—Man. 182, 1503 (1933). *R. leptorhyncha* sensu Small, Fl. 195 (1903), non *R. leptorhyncha* C. Wright.—Infrequent on borders of ponds and in low places in the pine barrens of the Coastal Plain of Georgia, Florida, and Alabama. Georgia: edge of pond, just north of Ludowici, Long Co., *Eyles*, no. 6527 (CU); wet pine barrens about 3 miles east of Hawkinsville, Pulaski Co., *Harper*, no. 1377 (NY, type; US, isotype); wet pine barrens, Sumter Co., *Harper*, no. 467 (G, US). Florida: Tampa, Hillsborough Co., May, 1876, *Garber* (NY, US). Alabama: border of pond, Elberta, Baldwin Co., July 15, 1926, *Wolf* (StB).

Prior to 1933, *R. Harperi* was identified as *R. leptorhyncha* Wright, the type-specimen of *R. Harperi* being originally so determined by Britton. However, the two species can be readily distinguished from one another. Of the two, *R. leptorhyncha* has the much stiffer habit, an inflorescence exceeded by a tall upright bract, and tightly involute floral scales. *R. Harperi,* on the contrary, has the culm arched to nodding, a short bract subtending the fascicle, and loose floral scales. Nor is there any close resemblance in the achenes. Those of *R. leptorhyncha* are of the *fascicularis*-type—large, dark, dull, and broadly ovate. The achenes of *R. Harperi,* on the other hand, are pyriform, light brown, resembling, but surpassing in size, those of *R. filifolia* Gray.

24. R. **crinipes,** sp. nov. Planta caespitosa: foliis 2 mm. latis planis lineari-elongatis, debilibus, apicem versus triquetris et sparse serrulatis: culmis gracilibus subtriquetris, 6.9–7.4 dm. altis, laxe ascendentibus: fasciculis 4–5 compactis 1–2 cm. latis turbinatis lobatisque vel corymbosis; pedunculis fasciculorum lateralium subexsertis: bracteis setaceis parvis ornatis: spiculis lanceolatis 5 mm. longis confertis, ascendentibus vel patentibus

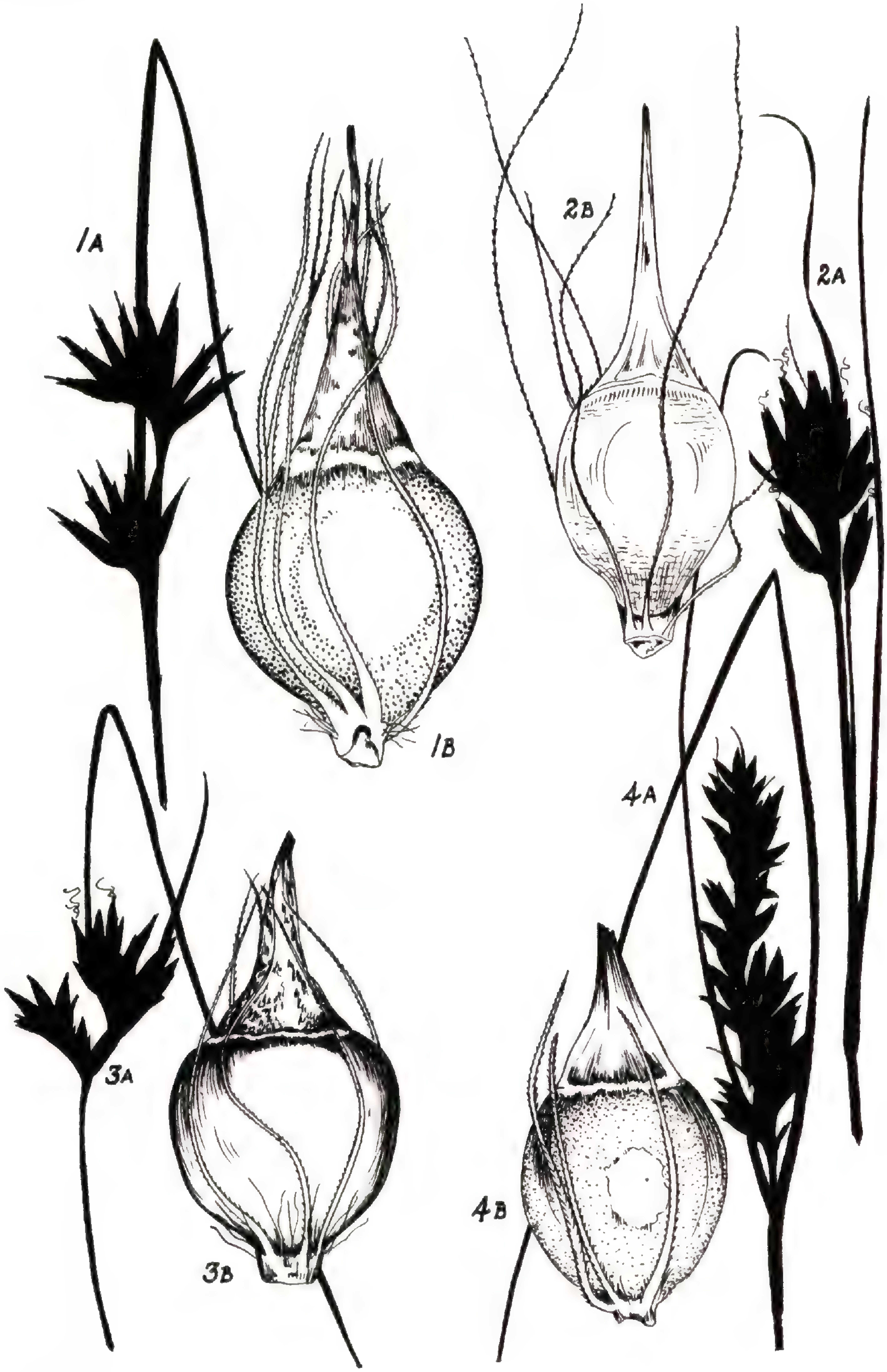
3-floris sed quarto terminali rudimentario, 2-carpis: squamis lanceolatis, aristulatis, laxe imbricatis, mox caducis chartaceis pallide castaneis: setis 6 rigide erectis, tuberculo approximate aequalibus: achaenio pyriformi 1.4 mm. longo 1 mm. lato, biconvexo laevi, marginem versus leviter depresso; umbone candido, conspicuo; stipa tereti persistente 6 mm. longa villis longis albis irregularibus ascendentibus vestita: tuberculo compresso-triangulo 0.8 mm. alto, margine hispido-scabrato. Plate 823, figs. 2A and 2B; Map 28.—Coastal Alabama. Alabama: dry places, roadsides (exsiccated), Mobile, Mobile Co., June, 1868, *Mohr* (US); ditches, border of ponds, Mobile, Mobile Co., June 18, 1868, *Mohr* (US, type).

This species, represented by two specimens collected by Mohr in the vicinity of Mobile, Alabama, is closely related to *R. filifolia* Gray. It differs from the latter in its generally larger habit with wider leaves, coarser culms, and in its languid habit and looser, more numerous and more irregular fascicles. Both species have, however, the pyriform achene, with its glossy surface picked out by a prominent pale disc, the six stiffly erect bristles and the deltoid, compressed and marginally hispid tubercle. The signal character which distinguishes *R. crinipes* from *R. filifolia* is the unique basal stipe of the former, which is 0.6 mm. long, remains attached to the achene, and is clothed with a tangle of white, ascending hairs.

25. R. filifolia Gray. Densely caespitose: basal leaves filiform, flexuous; cauline leaves filiform to rarely 2 mm. wide, flat, upper margins minutely serrulate: culms terete, slender, typically flexuous, 3.3–6.5 dm. high: fascicles 2–3, turbinate to corymbiform, 0.9–1.5 mm. wide; terminal fascicle at least twice exceeded by a wiry undulant bract: spikelets long-ovoid, 3–4 mm. long, closely approximate, 3–6-flowered, maturing 1–4 achenes: scales mucronulate, ferruginous, loose, caducous so that at maturity the lower part of the rachis is exposed: bristles 6, upwardly serrulate, stiffly erect, equalling to slightly overtopping the tubercle: achene pyriform, 0.6–0.8 mm. wide, 0.9–1 mm. long, lenticular, biconvex, marginate, caducous, the face glassy with a white lustrous disc: tubercle deltoid-compressed, 0.4–0.6 mm. high, pale, with the margin hispid-scabrous. Plate 822, figs. 3A and 3B; Map 35.—Gray in Torrey, Ann. Lyc. N. Y. iii. 366 (1836); Chapman, Fl. So. U. S. 527 (1860); Britton, Mem. Soc. Cubana Hist. Nat. ii. 195 (1916); Small, Fl. 195 (1903) and Man. 181 (1933). *Phaeocephalum filifolium* House, Am. Midland Nat. vi. 202 (1920).—Margins of ponds or damp pockets in pinelands on the Coastal Plain of New Jersey, south to Florida, and west

S. G. del.

Rhynchospora Harperi: fig. 1A, inflorescence, × 2; fig. 1B, achene, × 20.
R. crinipes: fig. 2A, portion of inflorescence, × 2; fig. 2B, achene, × 20.
R. Curtissii: fig. 3A, inflorescence, × 2; fig. 3B, achene, × 20.
R. pleiantha: fig. 4A, portion of inflorescence, × 2; fig. 4B, achene, × 20.



RHYNCHOSPORA LEPTORHYNCHA: FIG. 1A, inflorescence, × 2; FIG. 1B, achene, × 20.
R. FUSCA: FIG. 2A, portion of inflorescence, × 2; FIG. 2B, achene, × 20.
R. GAGERI: FIG. 3A, inflorescence, × 2; FIG. 3B, achene, × 20.
R. JOVEROENSIS: FIG. 4A, portion of inflorescence, × 2; FIG. 4B, achene, × 20.

to eastern Texas; also in central and eastern Cuba. NEW JERSEY: sandy and peaty pond-hole ca. 1 mile west of Bennett, Cape May Co., *Long*, no. 13625 (G). DELAWARE: Queen Anne Road, east of Ellendale, Sussex Co., Aug. 17, 1899, *Commons* (P). VIRGINIA: upper border of siliceous and argillaceous shore, Airfield Mill-pond, southwest of Wakefield, Sussex Co., *Fernald & Long*, no. 14301 (G). NORTH CAROLINA: *Mr. Curtis*, in Gray's handwriting (NY, TYPE); moist savannah between Newport and New Bern Highway, no. 70, Craven Co., *Blomquist*, no. 11241 (D, G); moist sandy soil between Morehead City and Newport, Highway no. 70, Carteret Co., *Blomquist*, no. 11238 (D, G); wet sand, 7 miles southwest of Wilmington, Brunswick Co., *Godfrey & Shunk*, no. 4117 (G, NC). SOUTH CAROLINA: grass-sedge bog or savanna, 12 miles north of Georgetown, Georgetown Co., *Godfrey & Tryon*, no. 749 (CU, D, G, NY, P); damp soils, Oct., *Ravenel* (G). GEORGIA: margin of cypress pond, north of Douglas, Coffee Co., *Harper*, no. 1434 (G, US); pineland pool just east of the Clinch Co. line on U. S. Route 84, Ware Co., *Eyles*, no. 6328 (CU). FLORIDA: moist pine barrens near Jacksonville, Duval Co., *Curtiss*, no. 3153 (CU, G, P, US); margin of flatwoods pond, Welaka, Putnam Co., *Laessle*, no. 13 (CU); Indian Mound near Citrus Center, DeSoto Co., *Small*, no. 9918 (NY); cypress swamp, vicinity of Ft. Myers, Lee Co., *Standley*, no. 12865 (US); hammock north of Eagle Bay near Kissimmee River, Okeechobee Co., *Small*, no. 9188 (G); margins of ponds in pine barrens, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 864b (G, NY, US). ALABAMA: about swamp, Elberta, Baldwin Co., Aug. 24, 1926, *Wolf* (StB); in woods, Spring Hill, Mobile Co., *Langlois*, no. 178 (US). MISSISSIPPI: Ocean Springs, Jackson Co., *Tracy*, no. 4866 (NY, US); Biloxi, Harrison Co., *Tracy*, no. 2926 (NY). LOUISIANA: vicinity of Covington, St. Tammany Parish, *Arsène*, no. 11869 (US); frequent, low prairies, vicinity of Lake Charles, Calcasieu Parish, *Mackenzie*, no. 443 (Mo, NC). TEXAS: ponds, Hempstead, Waller Co., *Hall*, no. 717 (Mo, US). CUBA: in lagoon near El Paynes, between Guane and Remates near sea level, Pinar del Rio, *Killip*, no. 32373 (CU, US); Laguna Los Indios and vicinity, Pinar del Rio, *Shafer*, no. 10819 (NY); Herradura, Pinar del Rio, *Baker & Abarca*, no. 4195 (NY); savanna, Vivijagua, Isle of Pines, *Britton, Britton & Wilson*, no. 15018 (NY); in wet sand, shore of Laguna Yaiti, Mordazo, Santa Clara, *Ekman*, no. 17083 (G); near lagoon, Asiento Viejo, Sabana de Manacas, Santa Clara, *León*, no. 9288 (NY).

26. R. FUSCOIDES Clarke. Caespitose: leaves 1–1.5 mm. wide, involute on drying, stiffly erect: culms obtusely triquetrous, slender, erect, 4.7–7.8 dm. high: fascicles 2–4, the terminal one turbinate to hemispherical, barely if at all exceeded by the sub-

tending bract, 0.9–2 cm. wide; peduncles of the lateral fascicles included or nearly so: spikelets lanceolate in outline, closely approximate, 3–6-flowered, 1–5-fruited, 3.5–5 mm. long: scales aristulate, loosely imbricate, somewhat caducous: bristles 6, approximating the height of the tubercle, stiffly erect, upwardly serrulate: achene pyriform, lenticular, conspicuously marginate, 0.7–0.8 mm. wide, 1.2–1.3 mm. long; the surface tending to become granular, drab to somewhat polished cinnamon-brown, with a paler central disc: tubercle deltoid, subulate, compressed, with the margin thickly setose. Plate 822, figs. 5A and 5B; Map 29.—Clarke in Britton, Trans. N. Y. Acad. Sci. xi. 89 (1892), in part and excl. syn. *R. fascicularis*, var. *distans* Chapm., *nomen nudum;* Clarke in Urban, Symb. Ant. ii. 124 (1900), excl. syn. *R. fascicularis*, var. *distans* Chapm. and *R. fusca* hb. Chapm., first valid publication; Britton, Mem. Soc. Cubana Hist. Nat. ii. 195 (1916). *R. filifolia* sensu Wright in Sauvalle, Anal. Acad. Ci. Habana, viii. 84 (1871) and Fl. Cub. 180 (1873), non Gray in Torrey. *R. distans* var. *microcarpa* Boeckeler, Flora, lxiv. 78 (1881).—Lagoon-margins and wet pinelands of western Cuba. Cuba: *Wright*, no. 3783 (G, NY, US, isotypes, this number cited by Clarke as type of *R. fuscoides* and by Boeckeler as type of *R. distans* var. *microcarpa*); wet grassy places, pinelands, at 12 km. of highway to La Coloma, Pinar del Rio City, Pinar del Rio, *Ekman*, no. 17807 (NY); swale in pinelands, Laguna Santa Maria, Pinar del Rio, *Britton, Britton & Gager*, no. 7137 (NY); border of lagoon, Laguna Santa Maria, Pinar del Rio, *Britton, Britton & Gager*, no. 17179 (NY, US); wet pine woods, Pinar del Rio, Sept., 1863?[1] *Wright*, (NY).

R. fuscoides is closely related to *R. filifolia* Gray, a species of the Coastal Plain which also occurs in Cuba. *R. fuscoides* can be distinguished in the field, however, by its coarser, stiff unbending habit, its lack of filiform basal leaves, its culms which frequently bear 4 fascicles, and its long spikelets. *R. filifolia* has a delicate habit, with the culms normally flexuous, the basal, and often the cauline leaves as well, filiform and arching, and the fascicles limited to 3. In *R. fuscoides* the terminal fascicle is subtended by a short bract which may slightly exceed the fascicle; in *R. filifolia*, however, the bract is prominent, undulant, and at least twice the height of the fascicle.

Under a lens the tiny achenes of *R. filifolia*, with their glassy surfaces picked out by the lustrous white discs, are unmistakable. Those of *R. fuscoides* are, by contrast, less pyriform in outline,

[1] See Underwood, Bull. Torr. Bot. Cl. xxxii. 297 (1905).

longer, with a dull and often granulose drab-brown surface, somewhat relieved by lighter discs.

Boeckeler in 1880 was the first to recognize that the specimens of Wright's no. 3783[1] were not *R. filifolia* as labeled. He set them off, therefore, as var. *microcarpa* of *R. distans* (Michx.) Vahl but added, ". . . Torrey's Pflanze wird durch eine andere schmächtige Form, *Rh. gracilenta* A. Gray, mit der typischen Form der *R. distans* genau verbunden." However, so utterly different in all but the most superficial details are the Wright specimens from *R. distans* and *R. gracilenta* that it is difficult to imagine wherein lay Boeckeler's basis for the suggested relationship.

By 1892 Clarke had evidently studied the Wright material and come to the decision that its status was that of a new species; for in that year Britton included in his list of North American Rhynchospora, *R. fuscoides* Clarke, based on Wright no. 3783. The description of the new species was not published, however, until 1900, when it appeared in Clarke's treatment of the West Indian Cyperaceae for Urban's Symbolae Antillanae ii. Clarke, in giving the synonymy of *R. fuscoides*, lists both *R. distans* var. *microcarpa* Boeckl. and *R. fascicularis* var. *distans* (Michx.) Chapm., probably taking his cue for the inclusion of the latter from Boeckeler's original misalliance.

Series 5. **Fasciculares,** ser. nov. Inflorescentia fasciculata vel cymoso-fasciculata (*R. Gageri* excepta) rigida: squamis castaneis vel furvis: setis antrorse serrulatis rudimentariis vel bene evolutis: achaenio late ovato vel elliptico laevi castaneo vel fusco; saepe disco pallido.

Plants of usually moist areas in pineland and savannas of the Coastal Plain, West Indies and Central America. Habit caespitose: leaves filiform to 4 mm. wide: culms stout and erect to capillary, then occasionally procumbent: cymes usually fasciculate, simple or compound (spiciform in *R. Gageri*), stiff: scales castaneous to blackened: bristles rudimentary to well formed, antrorsely serrulate: achene broadly ovate to elliptic, smooth, castaneous to blackish-brown, often with a prominent pale disc, usually dull: tubercle triangular, compressed, often prolonged.—*Rhynchospora* V. *Glomeratae* Small, Man. 175 (1933), in part.

[1] One of the sheets of Wright's no. 3783 at the New York Herbarium is mixed. The other species is *R. leptorhyncha* Wright in Sauvalle. According to C. B. Clarke (Urban, Symb. Ant. ii. 125 (1900)), this is also true of a sheet of the same number in the herbarium at Kew.

Rhynchospora Series B. *Diplostyleae* Sect. 4. *Fuscae* Clarke in Urban, Symb. Ant. ii. 105 (1900), in part.

Key to Species in Series Fasciculares

a. Terminal cyme ovoid, spiciform, or consisting of 2 corymbiform fascicles aligned one above the other; setaceous bracts long; species endemic to the West Indies....*b.*

b. Terminal cyme composed of 2 secondary corymbiform fascicles aligned one above the other; scales dark brown to blackish; achenes 1.6–1.8 mm. wide, 1.6–1.8 mm. long 27. *R. leptorhyncha.*

b. Terminal cyme spiciform to ovoid, the division into fascicles not distinct; scales castaneous; achenes 1.2–1.6 mm. wide, 1.4–1.7 mm. long....*c.*

c. Cymes spiciform; surface of achene polished; bristles bearing a basal tuft of long white hairs; tubercles subulate-attenuate..............................28. *R. Gageri.*

c. Cymes ovoid-congested; surface of achene mostly dull; bristles basally hispidulous or with a few short inconspicuous hairs; tubercle deltoid................29. *R. joveroensis.*

a. Terminal cyme fasciculate, corymbiform when well developed; setaceous bracts short, slightly if at all exceeding the cymes; species continental, with a few also represented in the West Indies....*d.*

d. Bristles 12; achene 2–2.5 mm. long.................30. *R. Baldwinii.*

d. Bristles 6; achene 1.8 mm. long or less....*e.*

e. Achene minute, 0.8 mm. wide, 0.9–1 mm. high.......31. *R. Fernaldii*

e. Achene exceeding 1 mm. in width and 1–2 mm. in length....*f.*

f. Tubercle with a prominent strap- or beak-like prolongation....*g.*

g. Bristles equalling to falling short of the tubercles; tubercle broad-based, gradually tapering toward the apex, 1–2.6 mm. in length..............32. *R. gracilenta.*

g. Bristles rarely equalling the achene; tubercle basally triangular but abruptly contracted into a broad blunt beak..........................33. *R. Wrightiana.*

f. Tubercle deltoid to deltoid-subulate, not prolonged....*h.*

h. Bristles rudimentary to exceeding the achene; culms erect, often coarse................34. *R. fascicularis.*

h. Bristles rudimentary; culms filiform, loosely ascending to procumbent.........................35. *R. debilis*

27. R. leptorhyncha C. Wright. Stiffly caespitose: leaves 1–2 mm. wide, erect, numerous, with a long triquetrous tip due to the development of a carina: culms erect, obtusely triangular, 2.2–5.0 dm. high: inflorescence of 2 terminal simple corymbiform fascicles, 0.8–1.1 cm. wide, having not more than 20 spikelets, the one subsessile and subtended by a long setaceous bract, the other raised directly above it on a short erect branchlet; rarely a distant lateral fascicle on a slender erect peduncle present: spikelets ovoid, sessile, ascending to spreading, 2–3-flowered, mostly 1- or occasionally 2-fruited, 5.5–6.5 mm. long: scales prominently aristate, dark brown, often blackened, tightly imbricate: stamens 4: bristles 8, upwardly hispidulous; the tips

connivent around and exceeding the tubercle, plumose at their bases: achene elliptic to suborbicular in outline, strongly biconvex, 1.6–1.8 mm. wide, 1.6–1.8 mm. long; surface smooth, dull brown: tubercle deltoid-subulate, broad-based, nearly smooth to setose, usually pale, 1.4–1.8 mm. high. PLATE 824, FIGS. 1A and 1B; MAP 30.—C. Wright in Sauvalle, Anal. Acad. Ci. Habana, viii. 84 (1871) and Fl. Cub. 180 (1873); Clarke in Urban, Symb. Ant. ii. 124 (1900); Britton, Mem. Soc. Cubana Hist. Nat. ii. 195 (1916); Kükenthal, Fedde Rep. Spec. Nov. xxiii. 209 (1926); usually as "leptorrhyncha." *R. leptorhyncha* var. *laevirostris* Kükenthal, Fedde Rep. Spec. Nov. xxiii. 209 (1926). *R. gracilenta* sensu Clarke in Urban, Symb. Ant. ii. 126 (1900), non Gray. *R. tetrandra* C. Wright msc. ex Clarke in Urban, Symb. Ant. ii. 127 (1900), pub. in syn. of *R. gracilenta* sensu Clarke, non Gray. *Phaeocephalum leptorhynchum* House, Am. Midland Nat. vi. 202 (1920).—Near or in shallow water, western Cuba and the Isle of Pines. CUBA: *Wright*, no. 3784 (G, TYPE; NY, US, probable ISOTYPES)[1]; *Wright*, no. 3787 (G. This sheet of the number listed by Wright for *R. odorata* is *R. leptorhyncha*); in ponds, pinales, jurisdiccion Pinar del Rio, Oct., 1862 or 3[2] *Wright* (NY); moist places in pineland savannas to the south of Laguna de Junco, Pinar del Rio City, Pinar del Rio, *Ekman*, no. 17869 (NY); in brook between Pinar del Rio and Coloma at 11 kilometers, *Ekman*, no. 18252 (NY, US. Cited by Kükenthal with other Ekman numbers in type-description of *R. leptorhyncha* var. *laevirostris*); in pebbly pinelands, La Siguanea, Isla de Pinos, *Ekman*, no. 12187 (NY).

Specimens in the Wright collection without number but labeled *R. tetrandra* are undoubted *R. leptorhyncha*. The fact that Wright never published a species *tetrandra* suggests that he also realized this fact.[3]

C. B. Clarke in Urban's Symbolae Antillanae, ii. page 127, erroneously refers *R. tetrandra* to *R. gracilenta* Gray. On a basis of this misidentification, Britton[4], in his publication on Cuban Rhynchospora provisionally lists *R. gracilenta*, but states that the Wright material of *R. tetrandra* in the Herbarium of the New York Botanic Garden is *R. leptorhyncha*.

I am not keeping up Kükenthal's var. *laevirostris*. As the name indicates this variety is based on specimens, the achenes

[1] No. 3784 is also listed by Wright under *R. gracilis*. There is one sheet of this no. labeled "*Rh. gracilis*" in the Gray Herbarium.

[2] See Underwood, Bull. Torr. Bot. Cl. xxxii. 297 (1905).

[3] Also one Gray Herbarium sheet, C. Wright, no. 3787, labeled *R. odorata* is *R. leptorhyncha*.

[4] Mem. Soc. Cubana Hist. Nat. ii. 196 (1916).

of which have a smooth, rather than setose, tubercle. However, even in the specimens of sheets cited by Kükenthal, I find this character to be inconstant; for individual achenes from the same inflorescence vary considerably, some having nearly smooth, others rather densely setose tubercles.

28. R. Gageri Britt. Densely caespitose with thick, often fibrous bases: leaves setaceous, canaliculate, firm, arched-ascending, 1.8–3.3 dm. high: culms filiform, terete, ascending or somewhat arched, varying within a tuft from 0.5–2.2 dm. in height: terminal cyme fasciculate, compact, ovoid, small (0.9–1.2 mm. long, 0.6–1 cm. wide) rarely containing more than 15 spikelets, exceeded by a setaceous, recurving bract 0.4–1.3 dm. long which has the appearance of continuation of the culm: spikelets ovoid, crowded, 1-flowered with the achene terminating the axis, sessile, mostly ascending, closely approximate, 3–4 mm. long: scales aristulate, tightly imbricate, castaneous: stamens 3–4: bristles 6–8, delicate, upwardly serrulate, connivent around the tubercle which they fall short of to slightly exceed, bearing at their bases a few silky hairs which are 0.6 mm. in length: achene broadly ovoid, strongly biconvex, not umbonate, surface evenly browned, smooth, occasionally lustrous, 1.3–1.6 mm. wide, 1.4–1.7 mm. long: tubercle subulate-attenuate, compressed, smooth or rarely slightly setulose at the base, whitish, 0.9–1.1 mm. long. Plate 824, figs. 3A and 3B; Map 31.—Mem. Soc. Cubana Hist. Nat. ii. 196 (1916). *R. longifrons* var. β. *reducta* Kükenthal, Fedde Rep. Spec. Nov. xxiii. 209 (1926).—Moist savannas, Isle of Pines; western and central Cuba. Cuba: in white sand of Sabana de los Indios, Isle of Pines, *León*, no. 17501 (G); Hacienda San Julian, south of Mendoza, Pinar del Rio, *León & Roca*, no. 6955 (NY); in moist places, Mateo Sanchez, Pinar del Rio City, Pinar del Rio, *Ekman*, no. 17939 (G, US. This number cited by Kükenthal as *R. longifrons* Kük. var. *reducta*); Colpothrinax savanna, vicinity of Herradura, Pinar del Rio, *Britton, Britton, Earle & Gager*, no. 6618 (NY, type; US, isotype); savannas at La Ciega, Coabilla, Camaguey, *Acuña*, no. 4396 (NY).

29. R. joveroensis Britt. Densely caespitose with stiff quill-like bases: leaves 1–2 mm. wide, 3.9–6 dm. long, canaliculate, stiffly ascending, with arched filiform tips; upper margins setiferous: culms terete, rigidly erect, 2.6–4.5 dm. tall: cymes congested-spiciform; the terminal one 0.5–1 cm. wide, 2.5–4 cm. long, exceeded by a setaceous recurving bract 1.8–2.5 dm. long; the lateral smaller, on an included peduncle: spikelets ovoid, 3.5–4 mm. long, extremely compact, sessile, 1-flowered, with the achene terminating the axis: scales aristulate, tightly involute, castaneous: stamens 3–4: bristles 6–8, delicate, upwardly serru-

late, connivent at their tips, approximating the tubercle in length; bases without prominent hairs: achene obovoid, lenticular, with compressed margins and a prominent umbo which may be glossy, remainder of surface dull, smooth, brown, 1.2–1.3 mm. wide, 1.4–1.5 mm. long: tubercle deltoid-compressed, with heavily setose margins, 0.6–0.8 mm. long. PLATE 824, FIGS. 4A and 4B; MAP 32.—Mem. Soc. Cubana Hist. Nat. ii. 195 (1916). *R. longifrons* Kükenthal, Fedde Rep. Spec. Nov. xxiii. 209 (1926). —Lake margins, western Pinar del Rio, Cuba. CUBA: wet sand, Laguna Jovero to Laguna del Bufeo, Pinar del Rio, *Shafer*, no. 10992 (NY, TYPE; G, US, ISOTYPES); Hacienda San Julian, south of Guane, Pinar del Rio, *León & Roca*, no. 6935 (NY); shore of Laguna El Punto, Pinar del Rio City, Pinar del Rio, *Ekman*, no. 18263 (NY. One of several Ekman numbers cited by Kükenthal after type-description of *R. longifrons*); banks of south Lagoon, Santa Maria, near San Luis, Pinar del Rio, *León*, no. 19627 (G).

30. R. BALDWINII Gray. Forming a coarse clump: radical leaves commonly short, flat becoming carinate, 3–4 mm. broad, tips acutely triquetrous due partially to development of the keel; upper margins and keel finely serrulate: culms triquetrous, erect, becoming flexuous, 0.5–1 m. high: terminal fascicle corymbiform, 1.6–2 cm. wide, rarely accompanied by a small fascicle on a short stiff erect branchlet; lateral fascicles smaller, simple, exsertly pedunculate: spikelets ovoid, 1–3-flowered, 1–2-fruited, sessile, bursting, 5–5.5 mm. long: scales aristate, caducous, castaneous to dark brown: bristles 12, slender, typically convergent, upwardly hispidulous, shorter than the tubercle: achene ovoid to subrotund, lenticular-compressed, emarginate, dark brown, with a pale disc, smooth to minutely pitted, dull, 1.8–2 mm. wide, 2–2.5 mm. long: tubercle deltoid-compressed, whitish, 0.8–1 mm. long. PLATE 825, FIGS. 4A and 4B; MAP 33.—Ann. Lyc. N. Y. iii. 210, pl. 6, fig. 18[1] (1835); Chapman, Fl. So. U. S. 526 (1860); Small, Fl. 196 (1903) and Man. 182 (1933). *Phaeocephalum Baldwinii* House, Am. Midland Nat. vi. 201 (1920).—Peaty savannas and low pine barrens of the Coastal Plain from North Carolina southward through the peninsula of Florida and west to Mississippi. NORTH CAROLINA: savanna near Jacksonville, Onslow Co., *Godfrey*, no. 5822 (G); savanna near Burgaw, Pender Co., *Godfrey*, no. 4737 (G, NC); long-leaf pine and wire grass savanna, Carolina Beach, New Hanover Co., *Godfrey*, no. 4685 (G, NC). SOUTH CAROLINA: peaty excavated area in savanna at side of road, 12 miles north of Georgetown, Georgetown Co., *Godfrey & Tryon*, no. 8 (G, NY); in damp stiff soils, Santee Canal, *Ravenel* (G). GEORGIA: rather dry pine barrens between

[1] Figures 19 and 18 were apparently reversed in the printing; *R. Baldwinii* is fig. 18, not 19 as listed.

Guyton and Springfield, Effingham Co., *Harper*, no. 934 (G, NY, US); sandy bog, Bullock Co., *Harper*, no. 852 (NY); moist pine barren 2 miles west of Glennville, Tatnall Co., *Eyles*, no. 6435 (CU); *Dr. Baldwin*, fragment from Herb. Schweinitz (NY, TYPE). FLORIDA: moist pine barrens near Jacksonville, Duval Co., *Curtiss*, no. 4868 (G, NY, US); Hastings, St. Johns Co., *Tracy*, no. 9286 (G, NY, US); Tampa, Hillsborough Co., May, 1876, *Garber* (US); prairie, 18 miles east of Okeechobee City, St. Lucie Co., *Small et al.*, no. 9303 (NY); wet places, Bear Creek, Gadsden Co., June 1841, *Chapman* (G, in part); wet pine barrens, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 256a (G, NY, US); pine barrens 8 miles west of Apalachicola, Gulf Co., *Eyles*, no. 5783 (CU); swamps, Walton Co., 1885, *Curtiss* (NY). ALABAMA: low pine barrens, Mobile, Mobile Co., June, 1870, *Mohr* (NY); *Sartwell* (G). MISSISSIPPI: Biloxi, Jackson Co., *Tracy*, no. 4894 (NC, NY, US). LOUISIANA: New Orleans, *Drummond* (G).

31. R. **Fernaldii,** sp. nov. Planta caespitosa: foliis basilaribus 1–1.5 mm. latis planis marginibus laevibus vel subtiliter serrulatis, apicem versus triquetris: culmis teretibus tenuibus rigide erectis 2.5–5.2 dm. longis: fasciculis 1–2 congestis corymbiformibus; lateralibus exsertis pedunculatis; pedunculis erectis: spiculis ovoideis 2–2.5 mm. longis sessilibus confertis erectis vel patentibus 3–4-floris 2–3-carpis: squamis aristulatis laxe imbricatis fuscis: setis 6 antrorse hispidulis rigide erectis, achaenio fere aequantibus: achaenio lenticulari-obovoideo, biconvexo, parvo (0.8 mm. lato 0.9–1 mm. longo) laevi furvo; disco leviter pallidiore: tuberculo compresso-deltoideo, 0.2–0.3 mm. alto. PLATE 825, FIGS. 3A and 3B; MAP 34.—Pine barrens of southern Georgia, northern Florida and coastal Alabama. GEORGIA: rather dry sandy road in pine barrens near Camp Cornelia, Charlton Co., Aug. 8, 1902, *Harper*, no. 1487 (G, TYPE; NY, US, ISOTYPES); near Lem Griffin's Camp, Okefenokee Swamp, Clinch Co., Oct. 1938, *Eyles*, no. 164 (CU); piney woods, Billy Island, Charlton Co., July 7, 1912, *Bradley*, no. 4 (P). FLORIDA: in a low pineland, 7 miles southwest of St. Augustine, St. Johns Co., Aug. 8, 1929, *O'Neill* (CU); Sanford, Orange Co., Aug. 23, 1899, *Pieters*, no. 301 (US); in low pinelands, Alva, Lee Co., Oct. 30, 1917, *Francis*, no. 41 (US); low pine barrens near the seashore, Apalachicola, Franklin Co., Oct. 27, 1895, *Mohr* (US); pine barrens, Apalachicola, Franklin Co., July, 1870, *Chapman* (US); low pine barrens, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 5963 (G, NY; US, in part); *Chapman* (P, no locality given). ALABAMA: *Buckley*, no. 35 (NY).

In habit, *R. Fernaldii* suggests a dwarfed state of *R. fascicularis* var. *distans*. The plant is tufted, the slender culm is stiffly

S. G. del.

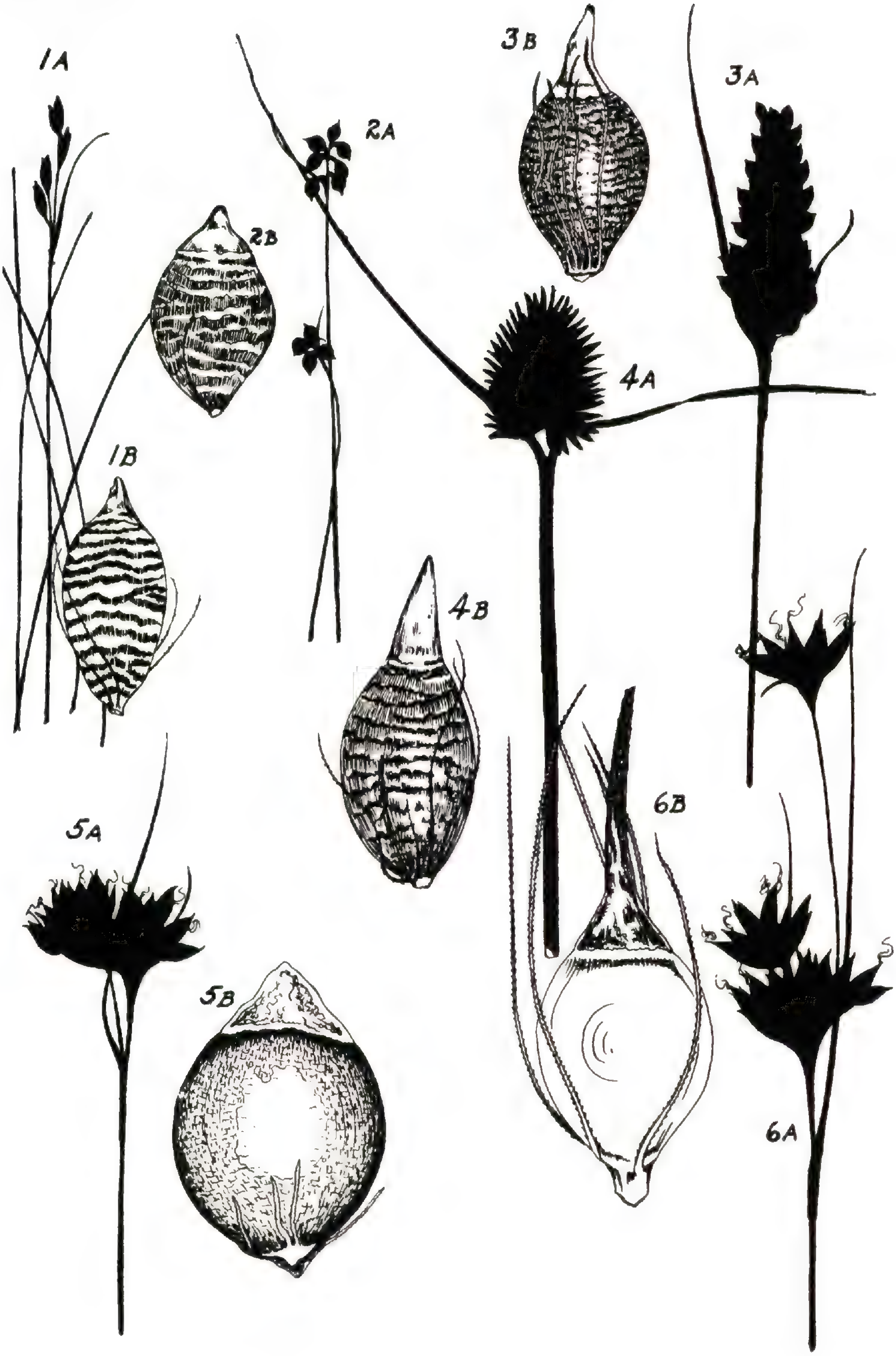
Rhynchospora fascicularis, var. typica: fig. 1A, portion of inflorescence, × 2; fig. 1B, achene, × 20.

R. fascicularis, var. distans: fig. 2A, portion of inflorescence, × 2; fig. 2B, achene, × 20.

R. Fernaldii: fig. 3A, portion of inflorescence, × 2; fig. 3B, achene, × 20.

R. Baldwinii: fig. 4A, portion of inflorescence, × 2; fig. 4B, achene, × 20.

R. Wrightiana: fig. 5A, portion of inflorescence, × 2; fig. 5B, achene, × 20.



S. G. del.

Rhynchospora depressa: fig. 1A, inflorescence, × 2; fig. 1B, achene, × 20.
R. cernua: fig. 2A, inflorescence, × 2; fig. 2B, achene, × 20.
R. pruinosa: fig. 3A, portion of inflorescence, × 2; fig. 3B, achene, × 20.
R. nipensis: fig. 4A, inflorescence, × 2; fig. 4B, achene, × 20.
R. debilis: fig. 5A, inflorescence, × 2; fig. 5B, achene, × 20.
R. gracilenta: fig. 6A, portion of inflorescence, × 2; fig. 6B, achene, × 20.

erect, and the small terminal fascicle is corymbiform and frequently accompanied by a lateral fascicle on a slender peduncle. However, among the members of this series the spikelets and achenes of this species are unique in their minuteness. The former measure only 2–2.5 mm. in length and the tiny blackish achene varies from 0.9–1 mm. in length. I suspect that this character was in part responsible for the long neglect of this species, for at first glance the inflorescence does suggest an undeveloped state of var. *distans*. This species has been named in honor of Professor M. L. FERNALD.

32. R. GRACILENTA Gray. Caespitose: radical leaves filiform, about 10 mm. high, cauline leaves filiform to usually 1–2.5 mm. wide, flat; upper margins serrulate; tips triquetrous: culms terete, slender, erect to flexuous, 0.3–1 m. in height: terminal cyme a single fascicle, irregular in outline to corymbiform, with few spikelets, 0.8–1.2 cm. wide; or less often several fascicles on stiff branchlets; lateral fascicles 1–2 (rarely 3) on exserted peduncles: spikelets ovate, split open by the developing achenes, bearing 2–3 florets, the lowermost of which is often abortive, 1–2-fruited, sessile, 3–3.5 mm. long: scales aristate, castaneous: bristles 6, delicate, upwardly serrulate, falling short of to slightly exceeding the tubercle: achene oval to suborbicular in outline, 1.1–1.7 mm. wide, 1.3–1.8 mm. long, compressed, umbonate, smooth, dull dark brown at maturity, often with a conspicuous light disc: tubercle broad-based, with a long slender strap-like terminal extension, strongly compressed, 1–2.6 mm. long. PLATE 826, FIGS. 6A and 6B; MAP 36.—Ann. Lyc. N. Y. iii. 216, pl. 6, fig. 27 (1835); Chapman, Fl. So. U. S. 527 (1860); Britton & Brown, Ill. Fl. i. 279, fig. 657 (1896); Britton, Man. 186 (1901); Small, Fl. 195 (1903) and Man. 182 (1933); Robinson & Fernald in Gray, Man. ed. 7: 200, fig. 320 (1908); Britton, Mem. Soc. Cubana Hist. Nat. ii. 196 (1916); Kükenthal, Fedde Rep. Spec. Nov. xxiii. 208 (1926). *R. gracilenta* var. *diversifolia* Fernald, RHODORA, xxxvii. 399 (1935). *R. fusca* sensu Gray, Gram. et Cyp. i. no. 93 (1834), in part.[1] *R. Drummondiana* Boeckeler, Fl. xli. 644 (1858). *R. trichophylla* Fernald, RHODORA, xxxix. 389 (1937). *Phaeocephalum gracilentum* House, Am. Midland Nat. vi. 202 (1920).—Bogs and moist areas in swales, common along the Coastal Plain from New Jersey to southeastern Virginia; apparently more scattered southward in the Carolinas and Georgia;

[1] No. 93 was apparently made up from a mixed collection. In the volume belonging to the library of the New York Botanic Garden, no. 93 is *R. gracilenta*, as stated by Gray in an appended correction; but in the volume belonging to the Gray Herbarium, no. 93 is *R. fusca* (L.) Ait. f., as stated on the original label.

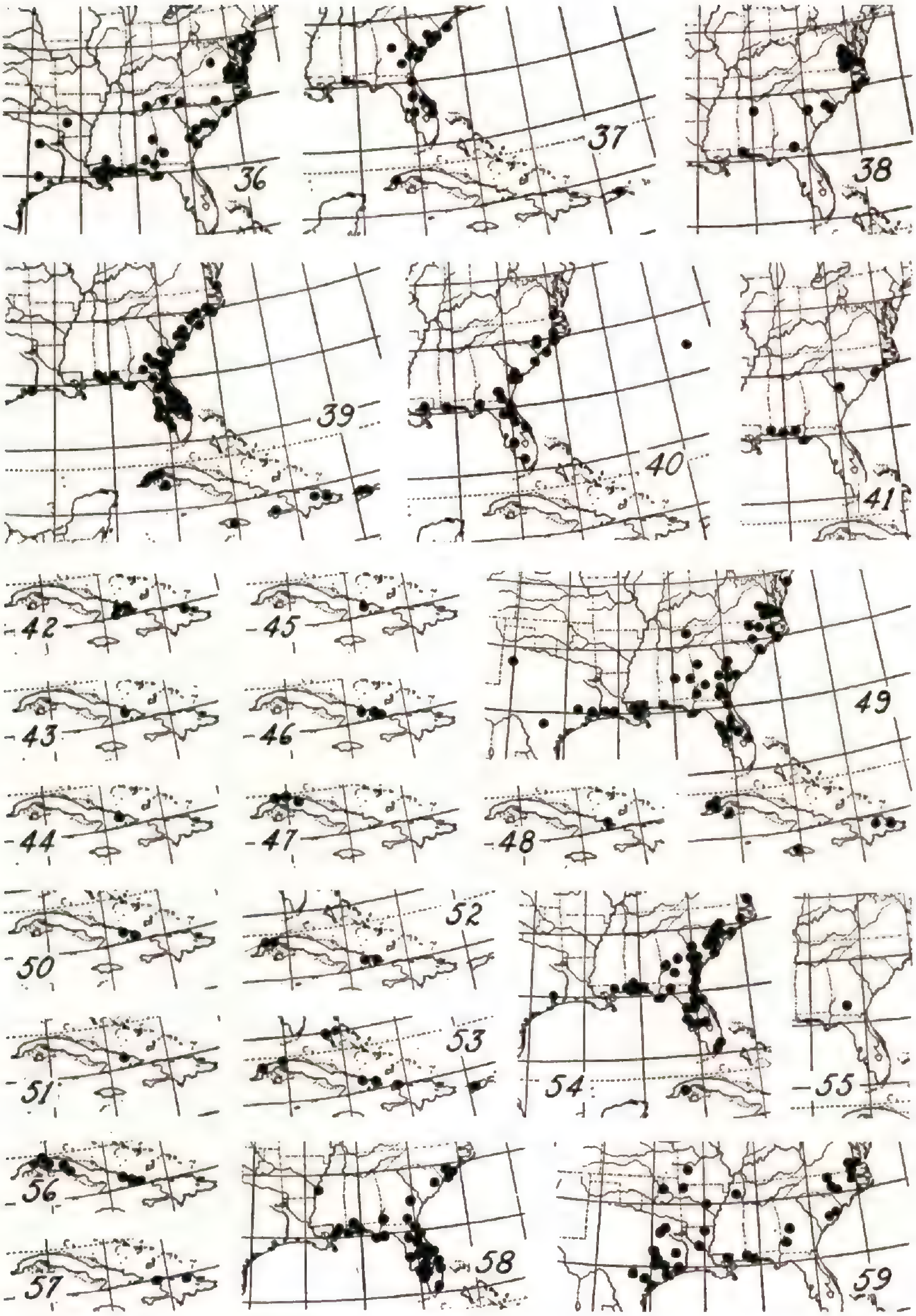
westward along the coast to eastern Louisiana; infrequent inland stations in the mountains of Virginia, North Carolina and Tennessee, and in central Arkansas and eastern Texas. The citation of the bulk of specimens from New Jersey and states south to Virginia has been omitted. New Jersey: "pine barrens of N. J., Aug.–Sept." in Gray's handwriting (NY, type). Virginia: cranberry-meadow in wet spots, Stuart's Draft, Augusta Co., *Carr*, no. 303 (G). North Carolina: wet grassy pineland, 12 miles west of Swan Quarter, Hyde Co., *Oosting*, no. 22 (D); low pineland at Dunn, Harnett Co., *Godfrey*, no. 6140 (D, G); sphagnum swamp, vicinity of Black Mt., Buncombe Co., *Standley & Bollman*, no. 10464 (US); dry sandy soil near Supply, Brunswick Co., *Blomquist*, no. 11266 (D, G). South Carolina: grass-sedge bog or savanna, 12 miles north of Georgetown, Georgetown Co., *Godfrey & Tryon*, no. 60 (D, G, NY); grass-sedge bog or savanna, 1 mile west of Chicora, Berkeley Co., July 24, 1939, *Godfrey & Tryon* (G); Sumter, Sumter Co., *Bartram*, no. 3740 (P); Aiken, Aiken Co., July–Aug., 1866, *Ravenel* (G). Georgia: pine barren, Pooler Road near Ogeechee Canal and Little Ogeechee River, Chatham Co., *Eyles*, no. 6239 (CU); moist pine barrens, Rushing Pond, near Statesboro, Bullock Co., *Eyles*, no. 6185 (CU); moist meadow, Leslie, Sumter Co., *Harper*, no. 414 (G, NY, US). Florida: sphagnous swamps near Jacksonville, Duval Co., *Curtiss*, no. 5072 (CA, NC, NY, US); Marianna, Jackson Co., *Tracy*, no. 4887 (US); wet pine barrens, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 4478a (G, NY, US). Alabama: Lee Co., June 29, 1897, *Earle & Baker* (NY); in a wet place, Perdue, Coffee Co., *Blanton*, no. 84 (G, US). Tennessee: permanently moist meadow with ox-bows of Abrams Creek, west end of Cades Cove, Blount Co., Great Smoky National Park, alt. 1700 ft., *Camp*, no. 1993 (US); grassy borders of small pond south of Altamont, Grundy Co., *Svenson*, no. 9181 (G); bogs between Tracy City and Coalmont, Grundy Co., *Svenson*, no. 9568 (G). Mississippi: Ocean Springs, Jackson Co., *Pollard*, no. 1005 (G, NY, US); Biloxi, Harrison Co., *Tracy*, no. 7003 (G, NY); Bay of St. Louis, Hancock Co., Sept. 13, 1883, *Langlois* (G, NY). Arkansas: sandy bogs, Malvern, Hot Spring Co., *Palmer*, no. 8095 (CA, Mo, P, US). Louisiana: vicinity of Covington, St. Tammany Parish, *Arsène*, no. 11735 (Mo); dampish soil, 2 miles west of Hammond, Tangipahoa Parish, *Trotter & Chilton*, no. 153 (La); New Orleans, Orleans Parish, *Drummond*, no. 397 (G, isotype of *R. Drummondiana* Boeckeler). Texas: swamps, Swan, Smith Co., *Reverchon*, no. 2921 (Mo) and no. 2918 (Mo); ponds, Hempstead, Waller Co., *Hall*, no. 717 (G).

A study of specimens of *R. gracilenta* selected to represent its

entire range tends to minimize the significance of var. *diversifolia* Fernald. This variety was defined on a basis of its "stiffer habit, broadish cauline leaves, and longer spikelets, fruits and tubercles." However, a stiffer habit and broader cauline leaves are not always accompanied by spikelets with larger achenes, and vice versa; nor would it be practical to re-define var. *diversifolia* solely upon the size of its achene, for the common occurrence of achenes of intermediate sizes would make the choice of definitive measurements purely arbitrary.

R. trichophylla Fernald was based on a peculiar colony in Sussex Co., Virginia. Identical in habit with the more robust specimens of *R. gracilenta,* this material bears achenes distinguished by bristles which barely equal the slightly prolonged deltoid tubercles. Typical achenes of *R. gracilenta,* on the other hand, have long bristles often exceeding the long strap-like tubercle. However, a close study of the material of *R. gracilenta* reveals that short bristles as well as the deltoid-attenuate tubercle of *R. trichophylla* fall within the range of achenial variability of the former species.

33. R. Wrightiana Boeckl. Densely tufted: leaves usually filiform to rarely 1.3 mm. wide, ascending to loosely spreading: culms filiform or very slender, wiry, stiffly erect to weakly ascending, leafy, 1–4.6 dm. high: fascicles 1–2, rarely 3, with 1–few spikelets, not exceeding 1 cm. in width; lateral fascicles on subexserted peduncles: bracts setaceous, several well exceeding the fascicle: spikelet ovoid, usually split, revealing the tubercle and upper portion of the achene, 1–2-flowered, with a rudimentary floret terminating the axis, 1–2-fruited, sessile, 3–3.5 mm. long: scales mucronate, castaneous, caducous: bristles 6, variable in height but rarely exceeding the achene, upwardly serrulate: achene elliptic in outline, biconvex, 1.2–1.3 mm. wide, 1.3–1.5 mm. long, smooth, dark brown; a somewhat paler disc indistinct or lacking: tubercle triangular-compressed, 0.6–0.8 mm. long, the tip prolonged as a broad, blunt beak. Plate 825, figs. 5A and 5B; Map 37.—Flora, lxiv. 78 (1881); Britton, Mem. Soc. Cubana Hist. Nat. ii. 197 (1916); Britton & Wilson, Sci. Surv. Porto Rico and Virgin Isl. v. 104 (1923); Small, Man. 183 (1933), excl. syn. *R. brachychaeta* Sauv. *R. gracillima* C. Wright in Sauvalle, Anal. Acad. Ci. Habana, viii. 85 (1871) and Fl. Cub. 181 (1873). *R. tenuis* Baldwin ex Gray, Ann. Lyc. N. Y. iii. 217 (1835), publ. in syn. of *R. distans* var. β., non Link. *R. distans* var. β. Gray, Ann. Lyc. N. Y. iii. 217 (1835). *R. distans*



Range of 36, Rhynchospora gracilenta; 37, R. Wrightiana; 38, R. debilis; 39, R. fascicularis, var. typica; 40, R. fascicularis, var. distans; 41, R. stenophylla; 42, R. pruinosa; 43, R. crispa; 44, R. Shaferi; 45, R. nipensis; 46, R. cernua; 47, R. tenuifolia; 48, R. depressa; 49, R. rariflora; 50, R. scabrata; 51, R. scabrata, var. laevifolia; 52, R. Lindeniana, var. typica; 53, R. Lindeniana, var. bahamensis; 54, R. Grayii; 55, R. culixa; 56, R. cubensis; 57, R. stenophylloides; 58, R. megalocarpa; 59, R. Harveyi.

var. *tenuis* (Baldwin) Britton, Trans. N. Y. Acad. Sci. xi. 90 (1892). *R. brachychaeta* sensu Small, Fl. 196 (1903), non C. Wright in Sauvalle. *R. pallida* sensu Clarke in Urban, Symb. Ant. ii. 126 (1900), in part, non M. A. Curtis. *R. distans* (Michx.) Vahl var. γ. *gracillima* (C. Wright) Kükenthal, Fedde Rep. Spec. Nov. xxiii. 208 (1926) and xxxii. 77 (1933).—Wet sand or peat of ditches, swamps, ponds or pockets in pineland of the Coastal Plain from southern North Carolina south to the Florida Peninsula and westward in coastal Alabama; also ponds of Cuba and mountains of Puerto Rico. NORTH CAROLINA: wet sand, Fort Caswell, Brunswick Co., *Godfrey & Shunk*, no. 4140 (G, immature). SOUTH CAROLINA: peaty pocket in pine barren, 5½ miles south of Georgetown, Georgetown Co., *Godfrey & Tryon*, no. 201 (G, NY, P); peaty pocket in pine barren, 5 miles northwest of McClellanville, Charleston Co., *Godfrey & Tryon*, no. 1120 (G, NY); gum-pond in pine barren, 4 miles west of Bonneau, Berkeley Co., *Godfrey & Tryon*, no. 1625 (G, NY); margin of barrow-pit near Savannah River Refuge, Jasper Co., *Eyles*, no. 6123 (CU). GEORGIA: drainage-ditch, Wilmington Island, Chatham Co., *Eyles*, no. 4380 (D); pine barrens, Bethesda Church, Effingham Co., *Eyles*, no. 6104 (CU); moist sandy place, Bullock Co., *Harper*, no. 897 (NY, US); margin of pine-barren pond about 2 miles northeast of Hawkinsville, Pulaski Co., *Harper*, no. 1376 (G, NY); sandy soil along railroad near Douglas, Coffee Co., *Harper*, no. 684 (NY, US). FLORIDA: moist pine barrens near Jacksonville, Duval Co., *Curtiss*, no. 4946 (G, NY, US) and 3152 (CU, D[1], G, NY, P, US); low pineland, vicinity of Eustis, Lake Co., *Nash*, no. 662 (G, NY, P, US) and no. 642 (G, NY, US); grassy swamp, Okeechobee Region, Brevard Co., *Fredholm*, no. 5750 (G, NY, immature); prairie, 18 miles east of Okeechobee City, St. Lucie Co., *Small et al.*, no. 9304 (NY); wet place, Hardin Co., July 29, 1940, *Schallert* (G, in part). ALABAMA: Mobile, Mobile Co., July 16, 1897, *Mohr* (CU). CUBA: swampy place, pinelands at km. 12 of the highway to La Coloma, Pinar del Rio City, Pinar del Rio, *Ekman*, no. 17824 (NY); shore of Laguna de Junco, Pinar del Rio City, Pinar del Rio, *Ekman*, no. 17861 (G, US); "sobre tembladeras en medio de lagunas, en la Vuelta de Abajo"[2], *Wright*, no. 3781 (G, TYPE; NY, US, probable ISOTYPES). PUERTO RICO: plants of the Luquillo Mt., *Wilson*, no. 97 (NY); in monte Jimenes, S^a^ de Luquillo, *Sintenis*, no. 1381 (NY, US).

This species was originally described by Wright in 1873 under the name of *R. gracillima*. Boeckeler, however, in 1881, noting

[1] One sheet of this number from Duke University is *R. fascicularis* (Michx.) Vahl var. *distans* (Michx.) Chapman.
[2] C. Wright in Sauvalle, Fl. Cub. 181 (1873).

an earlier application of this name by Thwaites[1] in 1864 to a species from Ceylon, renamed the West Indian species *R. Wrightiana*, in honor of its collector. Subsequently its status was confused by C. B. Clarke who mistakenly placed *R. Wrightiana* in the synonymy of the Atlantic coastal species *R. pallida* M. A. Curtis. With *R. brachychaeta* it formed the basis for Clarke's report of *R. pallida* from the West Indies. The plant which extends northward into southeastern Virginia and which has there passed as *R. Wrightiana* is *R. debilis*.

34. R. fascicularis (Michx.) Vahl. Caespitose, often coarsely so: radical leaves 1 (rarely less) to 4 mm. wide, curling to erect, flat, margins and keel finely serrulate: culms subterete and slender to stout and obtusely 3-angled, stiffly erect, becoming flexuous, 0.4 (rarely)–1.3 m. high: terminal fascicle simple or corymbosely compound, 1–5.5 cm. wide, the ultimate densely fasciculate clusters borne on stiff erect peduncles, lateral fascicles 1–3 or none, simple or less commonly compound, distant, exserted to subexserted on short erect peduncles: bracts several, foliaceous to setaceous, exceeding the fascicles: spikelets lance-ovoid to ovoid, 3–4.5 mm. long, erect, sessile, 2–4-flowered, with a terminal rudimentary floret, 1–3-fruited: scales ovate to lanceolate, prominently mucronate to aristate, caducous, 3–4 mm. long: bristles 5–6, rudimentary and short to well developed and exceeding the achene, stiffly erect, antrorsely serrulate: achene ovate to orbicular or elliptic, smooth, chestnut- to blackish-brown, evenly biconvex to umbonate, with or without a pale disc, obscurely marginate, 1.1–1.5 mm. wide, 1.3–1.5 mm. long: tubercle variable but essentially deltoid to deltoid-subulate, 0.4–0.7 mm. long.

34a. Var. **typica.** Habit usually very robust: spikelets usually with a conspicuous recurved mucro: achene ovate to orbicular, rarely elliptic, dark to blackish brown, umbonate, usually relieved by a prominent pale disc, 1.2–1.5 mm. wide, 1.4–1.5 mm. long: tubercle variable but essentially deltoid to deltoid-subulate. Plate 825, figs. 1A and 1B; Map 39.—*R. fascicularis* (Michx.) Vahl, Enum. ii. 234 (1806); Elliott, Sk. Bot. S. Car. and Ga. i. 60 (1816); Gray, Ann. Lyc. N. Y. iii. 210, pl. 6, fig. 20 (1835); Chapman, Fl. So. U. S. 527 (1860); Clarke in Urban, Symb. Ant. ii. 125 (1900), excl. syn. of European authors other than Vahl; Small, Fl. 196 (1903) and Man. 182 (1933); Britton, Mem. Soc. Cubana Hist. Nat. ii. 197 (1916). *Schoenus fascicularis* Michaux, Fl. Bor.-Am. i. 37 (1803). *R. distans* var. β. *fascicularis* Kükenthal, Fedde Rep. Spec. Nov. xxiii. 208

[1] Thwaites, Enum. Pl. Zeyl. 435 (1864).

(1926). *Phaeocephalum fasciculare* House, Am. Midland Nat. vi. 202 (1920).—Roadside-ditches, peaty savannas, low pine barrens and lake-margins, Princess Anne County in southeastern Virginia, and common southward on the Coastal Plain from North Carolina to the Peninsula of Florida; less frequent in the coastal states west to eastern Texas; also in western Cuba, Jamaica, Hispaniola, Puerto Rico and Central America. VIRGINIA: wet peaty depressions in sandy pineland, The Desert, Cape Henry, Princess Anne Co., *Fernald & Long*, no. 3790 (G, P). NORTH CAROLINA: New Bern, Craven Co., *T. H. Kearney Jr.*, no. 1974 (US); pineland at sea-level, Carteret Co., *Godfrey*, no. 6408 (G, NC, NY); pineland, White Lake, Bladen Co., *Godfrey*, no. 5982 (D, G); drainage-ditch at Carolina Beach, New Hanover Co., *Godfrey*, no. 4724 (G); savanna, 7 miles southwest of Wilmington, Brunswick Co., *Godfrey & Shunk*, no. 4113 (G, NC). SOUTH CAROLINA: sandy drainage-ditch, 2 miles west of Salters, Williamsburg Co., *Godfrey & Tryon*, no. 512 (CU, D, G, NY, P); shallow peaty pond in pine barrens, 9 miles north of Georgetown, Georgetown Co., *Godfrey & Tryon*, no. 758 (D, G, NY); drainage-ditch, 3 miles north of McClellanville, Charleston Co., *Godfrey & Tryon*, no. 683 (G); grass-sedge bog or savanna, 3 miles southwest of Manning, Clarendon Co., *Godfrey & Tryon*, no. 940 (G, NY); grass-sedge bog or savanna, 1 mile west of Chicora, Berkeley Co., *Godfrey & Tryon*, no. 842 (G, NY); wet sand pockets, 5 miles north of Ridgeland, Jasper Co., *Wiegand & Manning*, no. 599 (G). CAROLINA, Juin, *Michaux* Herb. (G, TYPE-PHOTO.; NY, TYPE-FRAGMENT from Michx. Herb.). GEORGIA: moist sandy roadside in pine barrens, Bullock Co., *Harper*, no. 878 (G); Wilmington Island, Chatham Co., *Eyles*, no. 4891 (CU); Wayne Co., *Baldwin* (P); green sphagnum swamp, 9 miles north of Darien on U. S. Route 17, MacIntosh Co., *Eyles*, no. 6439 (CU); pine woods, Kingsland, Camden Co., *Small & DeWinkler*, no. 9682 (NY); pineland-pool just east of the Clinch Co. line on U. S. Route 84, Ware Co., *Eyles*, no. 6327 (CU); hammock at edge of swamp on Billy's Island, Okefenokee Swamp, Charlton Co., *Eyles*, no. 6356½ (CU); margin of pine-barren pond near Downing, Coffee Co., *Harper*, no. 1440 (G, NY, US); moist pine barrens, Thomas Co., *Harper*, no. 1173 (G, US). FLORIDA: moist pine barrens near Jacksonville, Duval Co., *Curtis*, no. 4945 (G); low pineland, Lake City, Columbia Co., *O'Neill*, no. 7675 (CU); Hibernia, Clay Co., Mar., 1869, *Canby* (G, NY, US); ditch near Clyatt's Station, Gainesville, Alachua Co., July 13, 1940, *Arnold* (CU); wet flat-woods, Welaka, Putnam Co., *Laessle*, no. 15 (CU); dry sand, high pineland, vicinity of Eustis, Lake Co., *Nash*, no. 641 (G, NY, US); near Sanford, Seminole Co., Aug., 1931, *Rapp* (NY); in a low pineland, Bithlo, Orange Co., *O'Neill*, no. 5268 (CU);

prairies near Lake Washington, Brevard Co., *Small & DeWinkler*, no. 9741 (NY); Kissimmee, Osceola Co., May 10, 1901, *Mearns* (US); ditch, Polk Co., July 27, 1940, *Schallert* (G); in wet ditch, Lake Jovita, Pasco Co., *Britton*, no. 2609 (CU); near water, near St. Petersburg, Pinellas Co., *Mrs. C. C. Deam*, no. 2899 (G); pinelands near Fellsmere, Indian River Co., *Small*, no. 8868 (NY); Okeechobee Prairie north of Okeechobee City, Okeechobee Co., *Small et al.*, no. 9238 (NY); Palma Sola, Manatee Co., *Tracy*, no. 6996 (G, NY, US); ditch, Sarasota Co., July 29, 1940, *Schallert* (G); pinelands, east of Punta Gorda, Charlotte Co., *Small, Mosier & DeWinkler*, no. 10928 (NY); around ponds, Myers, Lee Co., *Hitchcock*, no. 423 (G, NY, US); low pineland, 5 miles south of Stuart on east coast, Martin Co., *O'Neill*, no. 5265 (CU); St. Vincent Island, Franklin Co., *McAtee*, no. 1806 (US); low pine barrens, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 4469 (G, NY, US); Lake Gentry, Santa Rosa Co., *Howell*, no. 1092 (US). Alabama: low pineland about Miflin Creek, Elberta, Baldwin Co., Aug. 25, 1926, *Wolf* (StB); low swampy pine barrens, Mobile, Mobile Co., July, 1872, *Mohr* (US). Mississippi: Ocean Springs, Jackson Co., *Pollard*, no. 1016 (D, G, NY, US); Long Beach, Harrison Co., Aug. 25, 1896, *Joor* (Mo); Cat Island, Hancock Co., *Lloyd & Tracy*, no. 359 (NY). Louisiana: in pine wood clearings, Slidell, St. Tammany Parish, Oct. 5, 1891, *Langlois* (NY); near Indian Village, east of New Orleans, Orleans Parish, *Killip*, no. 13968 (US). Texas: Jefferson Co., *Tharp*, no. 3055 (US). Cuba: in savannas, towards Bibijaguas, Nueva Gerona, Isla de Pinos, *Ekman*, no. 12535 (G, US); dry ground, Laguna Jovero and vicinity, Pinar del Rio, *Shafer*, no. 10752 (G, NY); sabanas, El Sabalo, Finca Sabanalamar, Pinar del Rio, near sea level, *Killip*, no. 32260 (CU); palm barrens west of Guane, Pinar del Rio, *Shafer*, no. 10500 (NY); among Acoeloraphe, on shore of laguna, Laguna Santa Maria, Pinar del Rio, *Ekman*, no. 17274 (US); sandy pine woods (damp) Pinar del Rio, Oct. 1863?[1] *C. Wright*, no. 3392[2] (NY); on edge of laguna, Herradura, Pinar del Rio, *Ekman*, no. 11585 (G); low savannas, Chirigota, Pinar del Rio, Oct. 26, 1863?[3] *Wright*, no. 3399?[2] (US); low wood at 420 m., north slope of Loma Pelada de Buenavista, Cayajabos, Pinar del Rio, *León*, no. 13561 (NY). Jamaica: summit of Bull Head, Chapelton to Bull Head, Middlesex, *Underwood*, no. 33646 (NY). Hispaniola: laterite soil at Dutreuil, Corail, Western Group, Massif de la Hotte, Dept. du Sud, Haiti, c. alt. 250 m., *Ekman*,

[1] See Underwood, Bull. Torr. Bot. Cl. xxxii. 297 (1905).

[2] The penciled number 3399 appears on 3 Wright sheets, the specimens of which are for the most part *R. fascicularis*. These are undoubtedly no part of the original "Cuba or. (Wr. 3399)" on which Grisebach based in part his description of *R. deflexa*.

[3] See Underwood, Bull. Torr. Bot. Cl. xxxii. 297 (1905).

no. 10741 (US); in savannas, El Valle, Sabana de la Mar, prov. de Samana, Cordillera Central, Dominican Republic, *Ekman*, no. 15667 (NY); forming colonies, in Sabana de Ponton, toward Cotui, Rincón, prov. de la Vega, Valle del Cibao, Dominican Republic, *Ekman*, no. 14623 (G, US). PUERTO RICO: in sphagnum, western end of Laguna Tortuguero, *Britton & Britton*, no. 7872 (NY, US); wet white sand, vicinity of Vega Baja, *Britton, Britton & Brown*, no. 5788 (NY); moist sandy soil, Santurce, *Heller & Heller*, no. 583 (NY, US).

34b. Var. DISTANS (Michx.) Chapm. Habit more slender than that of var. *typica:* spikelets mucronulate: achene elliptic in outline, gradually biconvex, not umbonate, chestnut to dark brown, without a well-defined central disc, 1.1–1.3 mm. wide, 1.3–1.5 mm. long: bristles 6, always exceeding the achene: tubercle compressed, triangular-subulate, with a narrow base. PLATE 825, FIGS. 2A and 2B; MAP 40.—Fl. So. U. S. 527 (1860). *Schoenus distans* Michaux, Fl. Bor.-Am. 1. 36 (1803). *R. distans* Vahl, Enum. ii. 235 (1806); Elliott, Sk. Bot. S. Car. and Ga. i. 59 (1816); Gray, Ann. Lyc. N. Y. iii. 216, pl. 6, fig. 28 (1835); Clarke in Urban, Symb. Ant. ii. 125 (1900); Small, Fl. 195 (1903) and Man. 182 (1933); Britton, Fl. Bermuda 53, fig. 81 (1918); Britton & Wilson, Sci. Surv. Porto Rico and Virgin Isl. v. 103 (1923); Kükenthal, Fedde Rep. Spec. Nov. xxiii. 208 (1926). *R. dommucensis* A. H. Moore, List of Pl. Coll. in Bermuda, 1905: 6, pl. 1 and 2 (1906). *Phaeocephalum distans* House, Am. Midland Nat. vi. 202 (1920). *Dichromena distans* Macbride, Field Mus. Pub. Bot. xi. 5 (1931).—Moist sandy or peaty pineland from southeastern Virginia southward along the Coastal Plain to the tip of Florida and west to Mississippi; also Bermuda. VIRGINIA: moist sandy and peaty pine barrens, south of Lee's Mill, Isle of Wight Co., *Fernald & Long*, no. 12273 (G, P); wet peaty pine barrens, east of Cox Landing, south of South Quay, Nansemond Co., *Fernald & Long*, no. 10551 (CU, G, NY, P). NORTH CAROLINA: savanna, Chocowinity, Beaufort Co., *Godfrey*, no. 5417 (G); sand-ridge, 5 miles west of Clinton, Sampson Co., *Godfrey*, no. 4502 (D, G); moist boggy places, north side of White Lake, Bladen Co., *Blomquist*, no. 10863 (D); pineland near Carolina Beach, New Hanover Co., *Godfrey*, no. 4708 (G, NC). SOUTH CAROLINA: peaty pocket in pine barren, 5 miles northwest of McClellanville, Charleston Co., *Godfrey & Tryon*, no. 1122 (D, G, P, NY). CAROLINA: *Michaux* (G, TYPE-PHOTO; NY, TYPE-FRAGMENT from Michaux Herb.). GEORGIA: shady woods between Guyton and Springfield, Effingham Co., *Harper*, no. 936 (G, NY, US); border of pond near Middleground Road, Chatham Co., *Eyles*, no. 6228 (CU); moist sandy roadside in pine barrens, Bullock Co., *Harper*, no. 878 (C, NY, US); margin of shallow pond in sandhills of Satilla River, Coffee Co., *Harper*, no.

1447 (G, NY, US); sphagnous bogs near Bugaboo Island, Okefenokee Swamp, Charlton Co., *Harper*, no. 1477 (G, NY, US); pine barren near Lem Griffin's, Okefenokee Swamp, Clinch Co., *Eyles*, no. 6373 (CU). Florida: damp shady woods near Jacksonville, Duval Co., *Curtiss*, no. 5072c (G, NY); low moist ground, Welaka, Putnam Co., *Laessle*, no. 20 (CU); flatwoods, Lake Helen, Volusia Co., Apr. 29, 1911, *Hood*, (G); marsh, Bithlo, Orange Co., *O'Neill*, no. 5117 (CU); "Bayhead" in wet soil, vicinity of Eustis, Lake Co., *Nash*, no. 802 (CU, G, NY, US); cypress swamp, northeast of Labelle, Lee Co., April 24, 1921, *Small & DeWinkler* (NY); sandhills east of Sebring, DeSoto Co., *Small & DeWinkler*, no. 9074 (NY); ancient sand dunes about Lake Jackson, Leon Co., *Small, Mosier & DeWinkler*, no. 10874 (NY). Alabama: low pineland about Miflin Creek, Elberta, Baldwin Co., Aug. 25, 1926, *Wolf* (StB). Bermuda: Pembroke Marsh, *Brown, Britton & Bisset*, no. 2122 (NY); Devonshire Marsh, *Brown & Britton*, no. 170 (NY); Devonshire Marsh, *A. H. Moore*, no. 3004 (G, type of *R. dommucensis* A. H. Moore; NY, isotype).

The variability of this species, both in habit and appearance of the achene, was undoubtedly responsible for its original separation by Michaux into two distinct species, *Schoenus fascicularis* and *S. distans*. In 1805, Vahl transferred both species to *Rhynchospora;* and later Gray, following established precedent, also recognized both *R. fascicularis* and *R. distans*. However, in 1860 Chapman reduced *R. distans* to varietal rank under *R. fascicularis*, and in the third edition of his Flora dismissed it as "*R. distans* Nutt. the form with longer bristles." In 1926, Kükenthal, although apparently unfamiliar with the Flora of the Southern United States, reached a conclusion similar to that held by Chapman. The former, however, preferred to keep *R. distans* as the species and subordinated *R. fascicularis* as *R. distans* var. *fascicularis*. Obviously this was an unfortunate choice since, by International Rules, if the varietal rank is to be maintained the earlier decision of Chapman to preserve *R. fascicularis* and reduce *R. distans* must be followed.

Along the coastal plain from Virginia to Florida and west to Louisiana, *R. fascicularis* has been identified as a caespitose plant with a shock of coarse, often curling basal leaves 2–4 mm. wide, much shorter than the stiffly erect, subtriquetrous culms. The terminal cyme is nearly always irregularly compound, the spikelets 3–4.5 mm. long and composed of prominently aristate

scales 3–4 mm. in length. The achene is usually ovate to orbicular in outline, less frequently elliptic. Its surface is consistently smooth, blackish-brown, with a prominent pale disc. On smaller achenes, however, the disc may be indistinct or absent. Specimens from Virginia and Carolina have short rudimentary bristles not exceeding ½ the achene in height; but in Georgia and Florida occasional specimens occur in which the bristles may equal or exceed the achene.[1]

R. fascicularis in Cuba, Jamaica, Hispaniola and Puerto Rico is usually represented by comparatively poorly developed specimens with reduced inflorescences. The achenes of these specimens are, however, both long- and short-bristled, and are indistinguishable from those of the mainland.

All specimens with long-bristled achenes were formerly assigned to *R. distans*. According to previous definition, in addition to the increased length of its bristles, *R. distans* was separable from *R. fascicularis* by its consistently more slender habit. However, typically robust specimens of *R. fascicularis* from Florida and Georgia bear achenes with the long bristles of *R. distans;* and, vice versa, many of the more slender plants of the West Indies have rudimentary bristles, indicating *R. fascicularis*. To discriminate between *R. fascicularis* and *R. distans* on the basis of bristle-length or comparative size is to set up an arbitrary distinction.

On the other hand, slender specimens from Virginia, Bermuda and Carolina south to the tip of Florida and west to Mississippi, bear achenes which are consistently long-bristled, smaller in size, characteristically elliptic in outline, with evenly browned surfaces, and narrow-based, triangular, subulate tubercles. To this category belong the fragments of *S. distans* from the Michaux Herbarium secured by Dr. Torrey and now in the Herbarium of the New York Botanical Garden, so that the name, *R. fascicularis* var. *distans* (Michx.) Chapm. is properly applied to them. The coarse plants with strongly mucronate scales but dark ovate achenes and well developed bristles may be con-

[1] The original description of *S. fascicularis* was possibly based on a long-bristled individual, for Michaux states "setulis semine laevi duplo longioribus." Asa Gray, however, reports that achenes from the Michaux type have short rudimentary bristles, which is true of the fragment from the Michaux Herbarium now in the Herbarium of the New York Botanical Garden.

sidered as possibly transitional between this variety and the robust, short-bristled, widely-spread *R. fascicularis* var. *typica.*

35. R. **debilis,** sp. nov. Caespitosa: foliis vel filiformibus debilibus ascendentibusque vel 1 mm. latis erectis planis; marginibus apicem versus subtiliter serrulatis: culmis filiformibus rigidisque subteretibus, laxe ascendentibus vel procumbentibus, 2.5–4.4 dm. altis: fasciculis 1–(rare)2; fasciculo terminali congesto corymboso parvo (0.5–1.1 cm. lato); spiculis late ovoideis 2.5–3.2 mm. longis, sessilibus, confertis, 2-floris, tertio rudimentario, 1–2-carpis, saepe ab achaenio maturante apertis: squamis fertilibus fissilibus, quam achaenio brevioribus, valde caducis, castaneis vel fuscis, costis pallidis; setis 5–6 quam achaenio duplo brevioribus aut minus, antrorse serrulatis: achaenio late ovato vel orbiculari, lenticulari biconvexo 1.4–1.6 mm. lato 1.3–1.5 mm. longo laevi castaneo; disco pallidiore saepe obscuro; tuberculo compresso-deltoideo saepe apiculato 0.3–0.4 mm. alto; basi lato. Plate 826, figs. 5A and 5B; Map 38.—? *R. fascicularis* var. *trichoides* Chapman, Fl. So. U. S. 527 (1860), non *R. trichodes* Clarke.—Damp sandy or peaty clearings of the Coastal Plain from southeastern Virginia south to northern Florida and west to Alabama, with an inland station in the Alleghanies of Alabama. Virginia: exsiccated argillaceous swale, west of Petersburg Turnpike, north of Swift Creek, Chesterfield Co., July 18, 1936, *Fernald & Long*, no. 6084 (G, NY, P); wet pineland south of Petersburg, Prince George Co., July 13, 1938, *Fernald & Long*, no. 8602 (G, P); wet peaty clearing about 1 mile northeast of Burgess, Dinwiddie Co., Sept. 13, 1937, *Fernald & Long*, no. 7355 (G, P); sandy and peaty border of Cat Pond, south of Benns Church, Isle of Wight Co., June 15, 1938, *Fernald & Long*, no. 8118 (G, P, immature); damp sandy and peaty depressions back of the dunes, Rifle Range, south of Rudy Inlet, Princess Anne Co., July 30–31 and Aug. 4, 1934 *Fernald & Long*, no. 3797 (G, P); peaty and argillaceous clearing in pineland east of Courtland, Southampton Co., June 10, 1938, *Fernald & Long*, no. 8119 (CU, G, P, immature); depressions in argillaceous field north of Littleton, Sussex Co., July 22, 1936, *Fernald & Long*, no. 6085 (G, type; NY, P, US, isotypes); argillaceous and sphagnous meadow northwest of Taylor's Millpond, Greensville Co., June 12, 1939, *Fernald & Long*, no. 10145 (G, P). North Carolina: *Curtis* (P, no locality given); damp open sand 5 miles west of Swanquarter, Hyde Co., June 22, 1927, *Wiegand & Manning*, no. 598 (G); moist rich soil, low ground along main highway, Bettie, Carteret Co., July 17, 1922, *Randolph & Randolph*, no. 808 (G). South Carolina: cartroad through pineland-clearing, 5 miles south of Andrews, Georgetown Co., Aug. 11, 1939, *Godfrey & Tryon*, no. 1376 (D, G, NY);

sandy drainage-ditch, 2 miles west of Salters, Williamsburg Co., July 14, 1939, *Godfrey & Tryon*, no. 513 (G, NY); damp soils, Aiken, Aiken Co., Aug., 1866, *Ravenel* (G). GEORGIA: roadside, 5 miles east of Statenville, Echols Co., Dec. 31, 1937, *Eyles*, no. 2682 (CU). FLORIDA: *Chapman* (US, no. 61756). ALABAMA: wet situation, low woods, St. Bernard, Cullman Co., July 17, 1909, *Wolf*, no. 479 (StB); Mobile, Mobile Co., May, 1845, *Sullivant* (G); May, 1841, *Buckley* (G).

R. debilis, R. Wrightiana and the two varieties of *R. fascicularis* probably constitute the most difficult group of species within the Section *Eurhynchospora*. Both *R. debilis* and *R. Wrightiana*, for which *R. debilis* has been mistaken, are characterized by their wiry, filiform to slender culms which tend to become procumbent. The basal leaves of *R. Wrightiana* are typically filiform and sinuously ascending, often equalling the culm in height; rarely they are 1.3 mm. wide and stiff. The reverse is true of *R. debilis*. Its leaves are more often 1 mm. wide, flat, stiffly ascending and shorter than the culms. Occasionally, however, they are filiform, and then indistinguishable from those of *R. Wrightiana*. Similarly the fascicles of both species may be identical in appearance but, whereas those of *R. Wrightiana* are often reduced to 1 or 2 spikelets, those of *R. debilis* are typically corymbose and congested. A comparison of the achenes gives the most certain means of discrimination. That of *R. debilis* is round-ovate to orbicular, slightly umbonate, normally pale in the center, with dark brown somewhat depressed sides and blunt margins. It is surmounted by a deltoid broad-based tubercle which may be apiculate. The 5–6 subtending bristles are rudimentary, uneven in length, and rarely equalling ½ the achene. The achene of *R. Wrightiana*, on the contrary, is elliptic to suborbicular in outline, evenly biconvex, not umbonate, homogeneously brown or nearly so, and immarginate. The tubercle is basally deltoid but, unlike that of *R. debilis*, is apically prolonged into a broad blunt bill. The six bristles, although uneven in length, are well developed, often equalling the achene.

R. fascicularis is, by comparison with *R. debilis* and *R. Wrightiana*, a coarse, robust species. Of its two varieties only the weaker specimens of var. *distans*, with their narrow leaves, attenuated culms and reduced corymbs, might be confused with the more robust specimens of *R. debilis* or even *R. Wrightiana*. However,

the culms of normal specimens of var. *distans* are rarely, if ever, procumbent, the basal leaves are coarse, often spreading and curling, never filiform, with some of them at least 2 mm. wide, and in no case approximating the culm in height. The achene of *R. distans* most closely resembles that of *R. Wrightiana.* It is elliptic in outline, 1.1–1.3 mm. wide, 1.3–1.5 mm. long, evenly browned, and surrounded by six well developed bristles which frequently exceed the achene in height. However, the tubercle is merely triangular-attenuate, without the broad bill-like extension characteristic of *R. Wrightiana.* It is this difference in the character of the tubercle, coupled with the difference in habit, which leads one to believe that *R. Wrightiana* is a good species, and not merely a delicate state of *R. fascicularis* var. *distans.*

The filiform (rarely 1 mm. wide) leaves and culms, both of which are characteristically lax to procumbent, the small spikelets with their round-ovate caducous scales, and its suborbicular achenes distinguish *R. debilis* from the much coarser *R. fascicularis* var. *typica.* In habit it more nearly approaches *R. fascicularis* var. *distans;* but, unlike the latter, does not possess the broad radical leaves, the stiffly erect culms, and the bristles which in var. *distans* equal the elliptic achene and occasionally exceed the tubercle.

R. debilis has, however, been most commonly confused with *R. Wrightiana* Boeckl. The latter species, first collected in Cuba by Wright, has since been found on the Coastal Plain from Florida to North Carolina. Like *R. debilis,* it has a weak, lax habit coupled with strictly filiform leaves and culms. The fascicles of *R. Wrightiana,* however, contain even fewer spikelets than those of *R. debilis,* and rarely form the small corymbiform glomerules characteristic of the latter. The essential distinction appears upon a comparison of the achenes. The achene of *R. Wrightiana* is commonly elliptic, exceeded by the six bristles, and surmounted by a deltoid-attenuated tubercle 0.7–0.8 mm. high. That of *R. debilis* is suborbicular, accompanied by 5–6 abortive bristles which do not exceed ½ the achene in height, and is topped by a short deltoid tubercle only 0.3–0.4 mm. high.

This entity was probably singled out by Chapman under the name *R. fascicularis* var. *trichoides;* but since Chapman's types are obscure, and the name *trichoides* is not available for transfer

to the species, being already preëmpted by Clarke for a West Indian species, *R. trichodes*, it seems best to treat the plant as a new species, and to designate a type. I have selected as descriptive of the lax to procumbent habit the epithet, "*debilis*" which is taken from a memorandum written in Chapman's hand and attached to a sheet of this species in the Gray Herbarium.

(*To be continued*)

Jussiaea **Michauxiana,** nom. nov. *J. grandiflora* Michx. Fl. Bor.-Am. i. 267 (1803), not Ruiz & Pavon (1802).

A few years ago Mr. Bayard Long sent me for verification a specimen of a very large-flowered *Jussiaea* with the upper internodes of the stem, the veins of the leaves, the long (2.5–5 cm.) peduncles, the hypanthia and the very long calyx-segments (1.5–2 cm. long) all villous-hirsute. This plant, locally abundant on stream-banks in Berks County, Pennsylvania, where discovered by Mr. Hans Wilkens in 1941 and collected by him and by Mr. David Berkheimer, was passing as *J. grandiflora* Michx. and Mr. Long requested verification of the identification. Since Dr. Philip A. Munz had not then published his *Revision of the New World Species of Jussiaea* in Darwiniana, iv. 179–284 (1942), I sent the sheet directly to him and it promptly came back, identified as *J. uruguayensis* Camb. Subsequently a second sheet, labeled *J. uruguayensis*, was sent to the Gray Herbarium, this collected by Mr. W. C. Brumbach at another station in Berks County, Pennsylvania.

Thinking, as I often do, to fill a half-hour by interpolating a species into the otherwise completed manuscript of the *Manual*, I got out the eastern North American material of *Jussiaea* and the South American *J. uruguayensis* and, as so regularly happens, the incidental bit of annotation promptly became a problem. The Berks County plant was so unlike the latter species, as shown by many authentic specimens, that search of the covers brought together a number of other sheets quite like those from Berks County: from Salisbury, Maryland (as *J. decurrens*); from Wilmington, North Carolina, the plant originally and correctly sent out as *J. grandiflora* Michx., the identification changed to *J. repens* L., var. *glabrescens* Ktze., and the specimen, *Biltmore Herb.* no. 5547, cited by Munz under the "essentially glabrous"

J. repens, var. *glabrescens*, which has "sepals 4–7 mm. long" (the long-villous-hirsute sepals of the Wilmington plant 1.5 cm. long), "petals 7–12 (14) mm. long", those of the Wilmington plant 2.5 cm. long (also cited by Munz under *J. uruguayensis*); from Savannah, Georgia (type-region of Michaux's species); and a beautiful sheet sent by DeCandolle, through Arnott, to Asa Gray of *J. grandiflora* (identification changed by Munz to *J. uruguayensis*) of the villous-hirsute North American plant "naturalized in river at Montpellier", France. Material from Florida and Louisiana occurs in other herbaria.

Altogether this is a pretty impressive series, closely matching Michaux's description of his *Jussiaea grandiflora* from "paludosis Georgiae, circa *Savannah:*" ". . . pedunculis calycibusque villosis: foliis integerrimis, . . . superioribus lanceolatis: floribus maximis, decandris". Unfortunately, Michaux's most appropriate specific name must be rejected as preoccupied. It is wholly appropriate that his fine species should continue to be associated with his name. As contrasted with *J. uruguayensis* the newly proposed *J. Michauxiana* has the following distinctive characters; the measurements of the former taken chiefly from Munz.

J. uruguayensis (see Munz, l. c. pl. xix, fig. 2): flowering stems mostly freely branched; principal leaves narrowly lanceolate to oblanceolate or spatulate, 3–10 cm. long, 3–10 mm. wide (or much smaller); peduncles 1–2 cm. long; hypanthium 7–10 mm. long; calyx-segments 6–13 mm. long; petals 1.2–2 cm. long by 0.9–1.5 cm. broad.

J. Michauxiana: flowering stem simple or sparingly branched at summit; principal leaves oblong-lanceolate to -oblanceolate, 8–11 cm. long, 2–3 cm. broad; peduncles 2.5–5 cm. long; hypanthium 1.4–2 cm. long; calyx-segments 1.5–2 cm. long; petals 2.2–3 cm. long, 2–2.5 cm. broad.

Until I see more evident signs of intergradation than at present appear, I must consider the two species more distinct than are most recognized species of the *Onagraceae*. Although some plants of *Jussiaea Michauxiana* have been misidentified with the glabrous *J. repens*, var. *glabrescens*, the differences are so obvious as to need no discussion.

Jussiaea Michauxiana (as *J. grandiflora*) has been cultivated and obviously can be raised as far north as Pennsylvania. The Berks County plant is evidently a recent adventive, whether derived from cultivated plants we do not know. The species is apparently not native north of North Carolina.—M. L. Fernald.

Sherborn's Guide to Natural History Collections.—Whatever his particular errand in tracing collections or types, every systematic botanist makes almost daily use of Pritzel's *Thesaurus* (second edition), DeCandolle's *La Phytographie*, Britten and Boulger's *Index* (second edition), or Lasegue's *Musée Delessert*. To these tools of the taxonomist has been added more recently the invaluable "Reference-list of Collectors" compiled by Barnhart and Pennell and included in Pennell's "Scrophulariaceae of Eastern Temperate North America" (1935). But the worker engaged in critical monographic revisions always welcomes another source, heretofore unnoticed. In fact, the discovery of some bibliographic bonanza may constitute the richest 'strike' of a given piece of research! Though compiled by a veteran vertebrate paleontologist of England, and, accordingly, accenting especially the zoological rather than the botanical natural history collections, Sherborn's "Where is the ———— Collection?"[1] will augment our more strictly botanical sources. In my experience such avowedly zoological guides to the literature as the *Zoological Record* have proved of critical assistance in the tracing of some obscure citation.

The collections of the following botanists—selecting better known names—are located and often briefly commented upon:

Duke of Argyll, William Barbey, Hugh Cuming. Charles Darwin, Benjamin Delessert, A. Milne Edwards, Claudio Gay, H. B. L. Guppy, Robert Kidston, J. B. P. Lamarck, Carolus Linnaeus, C. P. von Martius, Thomas Nuttall, Thomas Pennant, and W. Roxburgh.

Of the construction of the 'guide' Dr. Sherborn writes: "This book contains facts accumulated over sixty years in answer to enquiries: 'Where is the ———— Collection?' It is not exhaustive; that were too much to expect and almost an impossibility, but it contains a vast deal of information now brought together and should be of service to enquirers. The original MS. has been on my table at the British Museum (Natural History) and of daily use to the Staff or others."

There are many sentence-length sketches that will stop your pursuit of some special errand. Thus, for the geologist Charles Lyell (1797–1875) one reads of "a fossil fish type that had been blackleaded and used as a door-step but is now cleaned and in the B. M."! When John Phillips (1800–1874), geologist of Oxford, "came to London he put up at 'La Belle Sauvage Inn' and in the night the whole of his fossils, which were packed in boxes, were stolen by thieves, who suspected the boxes contained plate. On discovering their error the thieves threw the collection over Blackfriars Bridge into the Thames, where they remain." There are many records of collections lost by fire or other causes—bitter losses that must forever impede science! "Rheims Museum. Destroyed by the Germans in 1916. Lemoine and Melville colls. gone." (Now we must add "Botanical Museum, Berlin-Dahlem . . ." And Asa Gray chronicled its already historic collections in 1841!).

Sherborn's 'guide', alphabetically arranged, is conveniently interleaved for the addition of matter by its user. So many random clues are given, moreover, that a running reading of the catalog will repay the effort; clues, for example, on where information may be found on 'French missionary collectors', 'French voyages', etc. etc.—Joseph Ewan, University of Colorado, Boulder, Colorado.

[1] *Where is the ———— Collection?*, by Charles Davies Sherborn. Cambridge University Press, Cambridge, 1940. 149 pp. 3s. 6d.

An Indispensible Index to Rhodora.—The Institut Botanique, Université de Montréal, announces the publication, probably in June, of a complete bibliography of all papers published in Rhodora, vols. 1–45 (1899–1943), which bear directly or indirectly upon the floras of Canada, Newfoundland, Alaska and the Canadian Arctic. This invaluable bibliographic index will also include a complete index of all botanical names newly proposed in Rhodora, regardless of geographic areas. The compilation is by Ernest Rouleau and, although the title is, naturally, French, the text is in English. Every one will want it. Advance orders, at $1.50, should be sent at once, that the publishers may forecast the demand, to Dr. Jules Brunel, Asst. Director, Institut Botanique, 4101 est, rue Sherbrooke, Montréal, Canada.

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H p. 827-831

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JOURNAL OF

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Vol. 46. June, 1944. No. 546.

A PLEA FOR THE ELIMINATION OF UNNECESSARY NOMENCLATURAL CHANGES

C. A. Weatherby and Marjorie W. Stone

All taxonomists resent the time lost from research work in dealing with necessary nomenclatural questions, but few who are not actually engaged in bibliographical work realize the extent of the problem. In the Gray Herbarium Card Index a card is inserted for each new name of flowering plant or vascular cryptogam growing wild in America. In case of a transfer two cards have to be published. This index includes literature from 1886 to date. During this time an estimated 232,000 cards have been published for these two groups of plants alone. No taxonomist can hope to keep in mind such a large number of names.

A good percentage of these new names and transfers really clarify the situation and make the future work of taxonomists easier, but during the last twelve years of indexing we have found numerous examples of unnecessary multiplication of names. Most of them fall readily into the following groups:

1) Nomina nuda used without being published according to the rules.
2) Herbarium names cited in synonymy.
3) Trinomials for which the category has to be designated by later authors.
4) Substitute names, superfluous when published.
5) Homonyms—names which have already been used for other plants and for which other names have to be substituted.

In most cases the publication of these names could be avoided if the names were checked in the Index Kewensis, its Supplements and the Gray Herbarium Card Index before publication.

Many taxonomists carry their names through the original Index Kewensis and the Gray Herbarium Card Index, but neglect the Index Kewensis Supplements which are necessary for genera represented in the old world or with cultivated species, as neither are included in the Gray Herbarium cards.

6) New combinations made without citation of basonym or with imperfect citation so that at best a bibliographer has to guess at the basis of the combination and at worst the combination has to be made over again by a later author.

7) New combinations occasioned by change of rank and not properly indicated by their authors. The number of new combinations has been greatly increased of late by diverse interpretations of the terms subspecies, varietas and forma. The Gray Herbarium cards show many epithets used first in a trinomial and then transferred to each of the above categories. Some taxonomists change the category without changing the author-citation or designating a transfer. It is almost impossible for a bibliographer to recognize these new combinations (or status novi) and they are often omitted from indices and consequently remade by later workers on the group.

The International Rules of Botanical Nomenclature definitely bar out or at least discourage the use of all but the last of these groups of names. Indexing current literature is very much simpler than it was twenty-five years ago when there was less conformity to a set pattern, but recently there have been more and more cases of new epithets given to plants when the category is changed. This confusion has arisen partly because of two different interpretations of the meaning of "Recommendation". The distinction is made in article 2 that rules are retroactive, but that recommendations are for the future; ". . . names or forms contrary to a recommendation cannot on that account be rejected, but they are not examples to be followed." Some taxonomists believe that for current and future work the recommendations are no less binding than the rules, others believe that they are merely suggestions to be followed or not as they appeal to the individual taxonomist. Had Recommendation XXXVI (3), "When a subdivision of a species becomes a species, or the inverse change occurs, the original epithet should be retained unless the resulting combination is rejected under Section 12", been a rule instead of a recommendation there could have been no possible question as to its meaning. As it is, many excellent taxonomists are taking advantage of Article 58, ". . . when

a group changes its rank, the earliest legitimate name or epithet given to the group in its new rank is valid, unless that name or the resulting association or combination is a later homonym (see Art. 60, 61)", to change the epithet. It may be argued that under a strict application of the rules (see Art. 60 (1, 2)) these epithets substituted when the category is changed should be thrown out as substitute names, superfluous when published. At any rate they are definitely contrary to Recommendation XXXVI (3) and they make the work of future bibliographers more difficult without, so far as we can see, serving any useful purpose. They multiply the number of unnecessary names when most of us can remember but a small portion of the necessary ones.

As a corollary to this, a recent author makes a new combination in *Distichlis* as follows "D. SPICATA var. **stricta** (Gray) . . . , comb. nov. *Brizopyrum spicatum* var. *strictum* A. Gray; . . . (Based on *Uniola stricta* Torr.)." This citing as a basonym the earliest use of the epithet under the accepted category instead of the earliest use of the name under any category is against established usage and if persisted in could cause a great deal of unnecessary checking and confusion. It is apparently contrary to Art. 49 which requires the *original* author to be cited. But even if permissible, if it were adopted in an index such as the Gray Herbarium Card Index it would mean that the card carrying the original use of the epithet for a given plant would no longer give all the nomenclatural synonyms since 1886, but only those synonyms in which the author uses the same category; and that our subscribers would have to check a different series of cards for each category to which a given group might be assigned. Later, when future workers tried to unravel the tangle and check back in the literature to find the correct author-citation after these two systems had been used simultaneously for a period of years there would unquestionably be much gnashing of teeth if not wailing.

In most branches of science, papers which prove to be of little value can be ignored by later workers. From the very nature of the subject this cannot be true of taxonomy; an error, or even an eccentricity, in nomenclature once made is likely to irritate and confuse future workers for many generations. It is

therefore especially important that taxonomists make easier the work of their successors by being meticulously considerate even in small matters.

Gray Herbarium.

NOTES ON NORTHERN MAINE PLANTS

Leroy F. Norton

In exploring remote areas in the general region of the headwaters of the Aroostook River and its tributaries several plants which are infrequent or rare in Maine have been collected.

The collecting trips represent long excursions over difficult terrain far beyond improved highways. The plants were either identified or verified by Glen Chamberlain of Presque Isle, Maine, and later checked at the Herbarium of the University of Maine by Dr. F. H. Steinmetz. For the distribution data I am indebted to the department of Botany and Entomology at the University of Maine and Glen Chamberlain who is at present making a critical study of the flora of the Aroostook River valley.

Draba arabisans Michx. T. 7, R. 9, Piscataquis County and T. 11, R. 8, Aroostook County.

Heretofore known only from Mt. Kineo in Piscataquis County and Day Mountain in Franklin County.

Draba lanceolata Royle. T. 6, R. 9, Piscataquis County.

The collection is significant in that it heretofore has not been known from Maine and interestingly bridges over a gap in range of the species in temperate northeast America as shown by Prof. M. L. Fernald.[1]

Asplenium Trichomanes L. T. 6, R. 8, Penobscot County and in T. 11, R. 8, Aroostook County.

This infrequent plant was found growing in profusion in restricted habitats. The species has not been known to occur north of Hancock and Oxford Counties.

Dryopteris fragrans (L.) Schott var. *remotiuscula* Komarov. T. 8, R. 9 and T. 8, R. 10, Piscataquis County, T. 11, R. 8, Aroostook County, and in T. 6, R. 8, Penobscot County.

In each locality the plant grew in profusion. A recent study

[1] Rhodora **36**: 358. 1934.

by Mrs. Edith B. Ogden[1] cites specimens from Aroostook, Piscataquis, and Hancock Counties and reports from several other counties. In general this fern is rarely collected in Maine. Its distribution appears to be in the less accessible forested area of the State.

Woodsia glabella R. Brown. T. 6, R. 8, Penobscot County, northeast of Mt. Katahdin.

Mrs. Ogden saw specimens from Somerset and Franklin Counties. She also cited one report from Aroostook County. The infrequency of this plant appears to be related to its adaptation to cold, wet, sheltered ledges.

Presque Isle, Maine.

Lilaea scillioides in southeastern Alberta.—*Lilaea scillioides* (Poir.) Haum. (long known as *L. subulata* Humb. & Bonpl.) is said to be widely distributed in the western part of the American continent from southern British Columbia to Chili. In the northern part of its range, the plant occurs sporadically and is rarely found outside of the coastal region. Muenscher in Torreya **38:** 8, 1938, has reported the species for Washington State. In a recent personal communication to the writer, Professor Muenscher states that apart from the Pacific Coast region he has only two records for the plant, one local station in Nevada and another in southern Idaho. Both of these interior stations are west of the Continental Divide.

Since *Lilaea scillioides* has not previously been reported east of the Continental Divide of North America, its occurrence in southeastern Alberta and some 160 miles east of the Divide is of considerable interest. The discovery was made by N. A. Skoglund of the Dominion Range Experiment Station, Manyberries, Alberta. Plants were collected on July 13 and 20, 1943, in a saline slough about eight miles south of Manyberries, Sec. 2, Tp. 4, Rge. 6, and specimens were sent to the writer for determination. Flowering and fruiting specimens of these collections have been deposited in the herbarium of the University of Alberta. Skoglund reports that *Lilaea* grew at the slough margin,

[1] M. S. Thesis, University of Maine, 1940.

in association with *Iva axillaris, Hordeum jubatum* and *Eleocharis palustris.*

Skoglund found *Lilaea* during a search for *Triglochin* in an area where several sheep had died. Two years ago, he had good evidence of the poisoning of sheep by *Triglochin maritima.* The sheep poisoning of last summer, Skoglund is convinced, was due to *Lilaea scillioides.* So far as the writer has been able to discover, this species has not previously been even suspected of causing poisoning of livestock. If *Lilaea* is found in sufficient quantity next summer, it is hoped that feeding experiments and also tests for hydrocyanic acid can be conducted.

The discovery may conceivably be of significance in connection with the Pleistocene flora and the post-glacial migration of species. The area in which *Lilaea scillioides* was found lies only about 30 miles southwest of the Cypress Hills. The upper parts of these hills were apparently unglaciated during the Pleistocene and may have been refugia for this and other species. On the other hand, migratory birds may have carried the fruits of the plant from the south or southwest in more recent times.—E. H. Moss, University of Alberta, Edmonton, Canada.

Is Hypochaeris glabra established in our Flora?—The tiny cat's-ear, *Hypochaeris glabra* L., has found a place in our manuals, as occurring in Maine, Ontario and Ohio; but the question arises as to its persistence. Abundant on the Pacific slope, it appeared in 1890 in a cultivated field at Orono, Maine, but was never found there again. In September, 1917, Mr. Norman P. Woodward found it on wool-waste in North Worcester, Massachusetts, obviously not abundant, since the specimen sent to the Gray Herbarium consists of cut-off fragments, not a whole plant. In April, 1939, Mr. Long and I found it in the railroad yard at Charleston, South Carolina. Schaffner in his Revised Catalog of Ohio Vascular Plants seems not to have known it in the state. Is it really established in the Eastern States?—M. L. Fernald.

RHYNCHOSPORA, SECTION EURHYNCHOSPORA, IN CANADA, THE UNITED STATES AND THE WEST INDIES

Shirley Gale

(*Continued from page 197*)

Series 6. **Rariflorae,** ser. nov. Foliis culmisque filiformibus erectis vel debilibus: cymis pluribus parvis patentibus: spiculis paucis remotis saepissime longe pedicellatis: setis antrorse serrulatis: achaenio ovoideo valde biconvexo castaneo vel pallido cancellato vel striato rugoso; rugis acutis.

Growing in bogs and on pond-margins of the Coastal Plain—*R. rariflora* infrequent inland and also occurring in the West Indies and Central America. Habit caespitose: leaves and culms filiform, erect to reclining: inflorescence of several small, open cymes: spikelets few, remote, mostly long-pedicellate: bristles upwardly serrulate, fragile: achenes ovoid, strongly biconvex, abruptly ridged, cancellate to striate, castaneous or pale, with 2 small whitish tongues of spongy tissue pushed out on either side at the base: tubercle deltoid, compressed.—*Rhynchospora* V. *Glomeratae* Small, Man. 175 (1933), in part. *Rhynchospora,* Series B. *Diplostyleae,* Sect. 4. *Fuscae* Clarke in Urban, Symb. Ant. ii. 105 (1900), in part.

Key to Species of Series Rariflorae

Spikelet 2–4-flowered, the achene when solitary accompanied by a sterile floret; bristles shorter than the achene; tubercle deltoid, 0.3–0.6 mm. high . . . . 36. *R. rariflora.*

Spikelet usually 1-flowered, with the axis then terminated by the solitary achene; bristles nearly equal to or exceeding the deltoid-acuminate tubercle which is 0.8–1.4 mm. long . . 37. *R. stenophylla.*

36. R. rariflora (Michx.) Ell. Densely tufted: leaves filiform to 1 mm. wide, involute at least on drying, loosely erect; upper margins finely serrulate: culms filiform to very slender, wiry, flexuous to reclining, 2.4–5.6 dm. high: cymes 1–3, small, lax, open, with few spikelets, corymbiform, the capillary branchlets ascending to spreading; spikelets broadly ovoid, rarely sterile, remote, long-pedicelled, 2–4-flowered, 1–3-fruited, 3–4 mm. long: scales round-ovate, obtuse, castaneous, often pushed apart at maturity: bristles 6, upwardly serrulate, unequal in length, the longest shorter than the achene: achene obovoid to rotund, strongly biconvex, 1.1–1.4 mm. wide, 1.3–1.4 mm. long, castaneous, traversed by abrupt ridges, striate to oblong-cancellate between the ridges; two small whitish ascending tongues of spongy tissue pushed out on either side at the base: tubercle compressed, deltoid, 0.3–0.6 mm. high. Plate 828,

figs. 4A and 4B; Map 49.—Sk. Bot. S. Car. and Ga. i. 58 (1816); Gray, Ann. Lyc. N. Y. iii. 197, pl. 6, fig. 3 (1835); Chapman, Fl. So. U. S. 524 (1860); Britton, Trans. N. Y. Acad. Sci. xi. 92 (1892); Clarke in Urban, Symb. Ant. ii. 130 (1900); Small, Fl. 196 (1903) and Man. 183 (1933); Britton, Mem. Soc. Cubana Hist. Nat. ii. 197 (1916); Kükenthal, Fedde Rep. Spec. Nov. xxxii. 78 (1933). *Schoenus rariflorus* Michaux, Fl. Bor.-Am. i. 35 (1803); Muhlenberg, Descript. Gram. 10 (1817). *R. setacea* sensu Grisebach, Cat. Pl. Cub. 243 (1866); C. Wright in Sauvalle, Anal. Acad. Ci. Habana, viii. 84 (1871) and Fl. Cub. 180 (1873); non Vahl. *Phaeocephalum rariflorum* House, Am. Midland Nat. vi. 202 (1920).—Open peaty depressions, bogs, or pond-margins of the Coastal Plain from New Jersey and southeastern Virginia south to the Florida Peninsula and west to Texas, with isolated inland stations in the mountains of Georgia, in central Tennessee and northern Texas; also in western Cuba, the Isle of Pines, Jamaica, the Dominican Republic, and Central America. New Jersey: clay-bottomed bog, Cold Spring, Cape May Co., *Gershoy*, no. 168 (G). Virginia: boggy swale, Otterburn, about 1 mile west of Amelia Court House, Amelia Co., *Fernald & Long*, no. 8986 (G, P); sphagnous bog about 1 mile northeast of Burgess, Dinwiddie Co., *Fernald & Long*, no. 7354 (G, P); argillaceous and siliceous boggy depressions about 3 miles southeast of Petersburg, at head of Poo Run, Prince George Co., *Fernald, Long & Smart*, no. 5656 (G); wet peaty margin of pine woods about 3 miles southeast of Zuni, Isle of Wight Co., *Fernald & Long*, no. 6083 (G, P); damp peaty meadows behind dunes, Rifle Range, south of Rudy Inlet, Princess Anne Co., *Smith & Hodgdon* in Pl. Exsic. Gray. no. 624 (CU, G, NY, P, US); peaty openings bordering wooded swamp along Mill Creek, about 1 mile north of Skippers, Greensville Co., *Fernald & Long*, no. 8601 (G, P). North Carolina: open pine forest, used soil south of Bennett Memorial, west of Durham, Durham Co., *Blomquist*, no. 9803 (D); edge of swamp, ½ mile within west boundary of county, highway 264, Nash Co., *Blomquist*, no. 7686 (D); rich moist low soil near Chocowinity, Beaufort Co., *Correll*, no. 1589 (D); moist rich soil, waste ground, Bettie, Carteret Co., *Randolph & Randolph*, no. 796 (G); damp soil, Fayetteville, Cumberland Co., *Biltmore Herb.*, no. 259b (US); dried-out road-making sand pit, 4 miles east of Bolton, Columbus Co., *Wiegand & Manning*, no. 622 (G); in roadside-ditch near Bolivia, Brunswick Co., *Blake*, no. 11893 (CU). South Carolina: Aiken, Aiken Co., July, *Ravenel* (G); sunny banks near pond, Lotus Pond, Savannah River Refuge, Jasper Co., *Eyles*, no. 6085 (CU). Georgia: Little Stone Mt., DeKalb Co., July 25, 1893, *Small* (NY); wet woods about 2 miles west of Wrightsville, Johnson Co., *Harper*, no. 1345 (NY, US); low grounds near depot, Millen, Jenkins Co.,

Harper, no. 781 (G, NY, US); moist sandy roadside, Bullock Co., *Harper*, no. 879 (G, NY, US); pine barren, 13 miles north of Waycross, Ware Co., *Eyles*, no. 7027 (G); low wet edge of woods between Folkston and Mattox, Charlton Co., *Correll*, no. 5520a (D); moist pine barrens, near Huntington, Sumter Co., *Harper*, no. 1396 (G, NY, US); damp margin of cypress-pond about a mile north of Jakin, Early Co., *Harper*, no. 3629 (P, US); *Michaux Herb.* (G, TYPE-PHOTO; NY, TYPE-FRAGMENT from Michaux Herb.). FLORIDA: moist pine barrens near Jacksonville, Duval Co., *Curtiss*, no. 4870 (G, NY, US); Eustis, Lake Co., *Nash*, no. 438 (CU, G, NY, US); in a wet ditch in low pineland at the crossroads east of Fivay, Pasco Co., *O'Neill*, no. 2613 (CA, CU, US); Tampa, Hillsborough Co., Oct., 1877, *Garber* (G, P, US); in moist ditch along roadside, about 5 miles north of Parish, Manatee Co., *Moldenke*, no. 1053 (D, NY); cut-over flatwoods 5 miles east of Lake Rudy, vicinity of Polk Co., *McFarlin*, no. 5145 (CU); Istokpoga Prairie, between Lake Istokpoga and Kissimmee River, Okeechobee Co., *Small & DeWinkler*, no. 9058 (NY); Alapittah Flats, St. Lucie Slough to Lake Okeechobee, St. Lucie Co., *Small & DeWinkler*, no. 9513 (NY); low grassy pine barrens, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 259a (NY, US). ALABAMA: Auburn, Lee Co., July 3, 1897, *Earle & Baker* (NY); boggy sunny slope near Jasmine (on M. and O. R. R.), Chilton Co., Apr. 28, 1921, *Harper* (NY; US with collector's no. 171); Mobile, Mobile Co., May, 1845, *Sullivant* (G). TENNESSEE: swamps between Spencer and Cagle, Van Buren Co., *Svenson*, no. 9644 (G). MISSISSIPPI: Ocean Springs, Jackson Co., *Tracy*, no. 4863 (NY, US); Biloxi, Harrison Co., *Tracy*, no. 4890 (G, NC, NY, US). LOUISIANA: in low pine barrens near Mandeville, St. Tammany Parish, May 1, 1893, *Langlois* (G, Mo, US); in cut-over pines four miles west of Hammond, Tangipahoa Parish, *Trotter & Chilton*, no. 141 (La); New Orleans, *Drummond*, no. 414 (G); in low prairies, Pointe aux Loups, Acadia Parish, Sept. 17, 1894, *Langlois* (CU, US); wet prairies, Sulphur, Calcasieu Parish, *Palmer*, no. 7712 (CA, P, US). TEXAS: along road on dry sandy soil, West Orlando, Orange Co., Apr., 1936, *Uphof* (CU); bogs, Hempstead, Waller Co., *Hall*, no. 716 (G, Mo, NY, US); San Antonio, Bexar Co., Sept. 20, 1891, *Plank* (NY); e. Texas, *Wright* (G); Hookley Co., *Thurow* (US). CUBA: white sand, vicinity of Los Indios, Isle of Pines, *Britton, Britton & Wilson*, no. 14175 (NY); Isle of Pines, *Taylor*, no. 59 (G, NY, US); Colpothrinax savanna, between Pinar del Rio and Coloma, Pinar del Rio, *Britton, Britton & Cowell*, no. 10083 (NY); low pinales, San Juan-Guanes, Pinar del Rio, *Wright*, no. 3400 (G); Hacienda San Julian, south of Guane, Pinar del Rio, *León & Roca*, no. 6937 (NY); moist places, Mateo

Sanchez, Pinar del Rio City, Pinar del Rio, *Ekman*, no. 17935 (NY); common, moist places near rivulets in pinelands, Herradura, Pinar del Rio, *Ekman*, no. 17719 (US). Jamaica: in the morass, Pedro Morass, Upper Clarendon, alt. 3000 ft., *Harris*, no. 11223 (NY, US). Hispaniola: slightly moist places, Pimental, prov. Duarte, Valle del Cibao, Santo Domingo, *Ekman*, no. 13252 (G, US); in savanna, El Valle, Sabana de la Mar, prov. de Samana, Cordillera Central, Santo Domingo, *Ekman*, no. 15700 (NY, US).

37. R. stenophylla Chapm. Tufted: leaves filiform, strongly involute, flexuous, ascending, upper margins minutely serrulate: culms filiform, wiry, flexuous, 3.1–9 dm. tall: cymes 1–2, small, weak, lax, corymbiform, bearing only 1–5 fertile spikelets on capillary ascending to divaricate branchlets: fertile spikelets ovate to lanceolate in outline, usually 1-flowered, 1-fruited, 3–5 mm. long, remote; sterile spikelets frequent, smaller, fusiform: scales lanceolate, pale, tightly imbricate: bristles 6, delicate, darker than the achene, with few antrorse serrulations, unequal in height, shorter than or exceeding the tubercle: achene obovoid, strongly biconvex, with surface transversely ridged, cancellate, pale, 1–1.3 mm. wide, 1.3–1.5 mm. long, with two small whitish ascending tongues of spongy tissue 0.4 mm. in height, pushed out on either side at the base: tubercle compressed, deltoid-acuminate, 0.8–1.4 mm. long. Plate 828, figs. 5A and 5B; Map 41.—Fl. So. U. S. 525 (1860); Small, Fl. 198 (1903) and Man. 186 (1933); Britton, Trans. N. Y. Acad. Sci. xi. 92 (1892), excl. syn. *R. tenuifolia* Griseb.—Infrequent in swamps or boggy ground, often in pine woods, Coastal Plain of the Carolinas, northwest Florida and Alabama. North Carolina: boggy ground ca. 3 miles north of Hampstead, Pender Co., *Blake*, no. 11906 (G, US). South Carolina: Aiken, Aiken Co., July, 1866, *Ravenel* (G, NY). Florida: Apalachicola, Franklin Co., *Chapman* (NY); low grassy pine barrens, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 4479 (US); swamp near Argyle, Walton Co., *Curtiss*, no. 5945 (G, NC, NY, US); fertile pine woods, Walton Co., *Curtiss*, no. 3174 (CU, P, US); Warrington, Escambia Co., *Tracy*, no. 8613 (G, NY, US). Alabama: Great Bog, Mobile Co., July, 1889, *Mohr* (US); *Bigelow* (G).

In contrast to *R. rariflora* (Michx.) Vahl, which it closely resembles, *R. stenophylla* has pale lanceolate scales with acute tips which, in the fertile spikelets, are closely imbricated about the solitary achene. A number of spikelets are characteristically erect, sterile, and fusiform. The scales of *R. rariflora*, on the other hand, are castaneous, broadly ovate, rounded or obtuse at the tip. Frequently the 2–several-flowered spikelet of the

latter matures 2–3 achenes which, during growth, cause the scales to separate. Unlike the condition in *R. stenophylla*, the spikelets of *R. rariflora* are usually fertile and distant on wiry capillary pedicels.

Two sheets of *R. stenophylla* from Chapman's Herbarium (both of which are now at the National Herbarium, no. 968501 and Biltmore Herbarium, no. 4479) have specimens the spikelets of which are comparatively numerous and more than 1-flowered. However, none of these spikelets have mature achenes, and, although they may have been merely immature when collected, there is also the possibility that they are pathological.

Series 7. **Cernuae,** ser. nov. Plantae valde caespitosae saepe depressae: basibus saepe densis fibrillosisque: foliis setaceis saepe crispis vel latis planis subcoriaceis: cymis parvis ovoideis capitatis vel spiciformibus vel leviter patentibus corymbiformibus: spiculis monocarpis: squamis saepe pallidis; apicibus saepe obtusis: setis antrorse serrulatis vel laevibus: achaenio parvo subtiliter ruguloso vel rugoso nitido et fusco vel castaneo vel valde corrugato et pallido.

Small plants (with exception of *R. nipensis*) growing in exsiccated locations, such as rocky crevices of stream-beds and dry pine barrens, mostly restricted to the mountains of eastern Cuba. Strongly caespitose, often depressed: bases often dense, occasionally fibrillose, due to the fraying out and the persistence of the fibro-vascular strands of the old cauline leaves: leaves filiform, setaceous, often curling, or broad, flat and subcoriaceous with the upper surfaces exasperate or pruinose: cymes small, ovoid-capitate, spiciform or weakly corymbiform: spikelets 1-fruited: scales often pale, with obtuse apices, frequently short, leaving the upper portion of the achene and tubercle exposed: bristles 6, extremely fine, weakly ascending; antrorse serrulations sometimes imperceptible: achenes small, their surfaces finely rugulose, glossy dark brown to castaneous and rugose, or pale and heavily corrugate: tubercle compressed, deltoid.—*Rhynchospora*, Series B. *Diplostyleae*, Sect. 5. *Glaucae* Clarke in Urban, Symb. Ant. ii. 106 (1900), in part.

Key to Species in Series Cernuae

a. Inflorescence of 1–3 loosely spiciform cymes or a solitary (rarely 2) ovoid capitulum; spikelets sessile; bases of the caespitose tufts often densely fibrous. . . .*b.*

b. Radical leaves 1.5 (rarely)–3 mm. broad, revolute, short, spreading; upper surfaces pruinose. . . . . .38. *R. pruinosa.*

b. Radical leaves capillary or if 1 mm. wide flat, attenuate, approximating the culm in length, ascending; upper surfaces smooth. . . .*c.*

c. Inflorescence loosely spiciform; spikelets erect to ascending; leaves capillary....*d*.

d. Plants forming depressed tufts; bases hard, fibrous; leaves short, 0.6 dm. in height or less, circinately coiled; culms 0.2–0.9 dm. tall; achene obovate, 1 mm. long....39. *R. crispa.*

d. Plants forming erect tufts; bases not fibrous; leaves 2 or more dm. in height, sinuously ascending to erect; culms 2–3.3 dm. high; achene slenderly obovate, 1.3–1.4 mm. long....40. *R. Shaferi.*

c. Inflorescence of 1–2 dense, ovoid capituli; spikelets erect, divergent and reflexed, the lowermost nodding in *R. cernua;* leaves filiform to 1 mm. wide....*e*.

e. Leaves 1 mm. wide, ascending, attenuate, approximately 3.5 dm. in length, nearly equalling to exceeding the culm; capitulum solitary; spikelets ascending to divaricate, occasionally reflexed; achene elliptic-ovoid, 0.8–0.9 mm. wide, 1.3–1.4 mm. long....41. *R. nipensis.*

e. Leaves filiform, curling, short, 0.15–0.8 dm. in length, less than ½ the height of the culm; capituli 1–(rarely)2; spikelets erect to nodding on short curved pedicels; achene obovoid, 0.8 mm. wide, 1 mm. long....42. *R. cernua.*

a. Inflorescence consisting of a terminal, small, spreading cyme and 1–4 lateral cymes; or, if cymes are poorly developed, some of the spikelets pedicellate; bases of the caespitose tufts not fibrous....*f*.

f. Mature achenes and bristles pale, the former flattened, corrugate and stipitate....*g*.

g. Plants forming depressed tufts; culms 1–1.5 dm. tall, weak; scales whitish; achene 0.7 mm. wide, 1.2 mm. long; bristles shorter than the achene....43. *R. depressa*

g. Plants forming erect tufts, not depressed; culms 2.4–4.4 dm. tall, slenderly erect; scales light brown; achenes 0.7–0.9 mm. wide, 1.3–1.4 mm. long; bristles exceeding the tubercle....44. *R. tenuifolia.*

f. Mature achenes and bristles castaneous to dark brown, the former strongly biconvex to plano-convex, finely to obscurely rugulose, not conspicuously stipitate....*h*.

h. Radical leaves usually exasperate on the upper surface, 1.5–2 mm. wide; the short cauline leaves as broad, often divaricate; culms with rarely more than 2 nodes; achene dark brown, plumply biconvex, with the bristles equally distributed on both sides....45. *R. scabrata.*

h. Radical leaves smooth-surfaced, 1 mm. wide, usually less; cauline leaves filiform, attenuate, ascending; culms 2 (rarely)–5-noded: achene castaneous, plano-convex, with the bristles assembled on the flat side 46. *R. Lindeniana.*

38. R. pruinosa Griseb. Caespitose, often depressed: basal leaves commonly short, 1.5 (rarely)–3 mm. wide, canaliculate, marginally revolute, with the roughened upper surface and the small white inclusions in many of the epidermal cells producing a silvery to rimy effect; culms triquetrous, slender, erect, 0.6–5.3 dm. high, seldom bearing more than two short divaricate leaves: inflorescence of 1–2 (rarely 3) small glomerules which are oblong-

ovate in outline, 3–6 mm. broad; the smaller axillary glomerule subexserted to exserted on a slender erect peduncle: the bract subtending the terminal glomerule occasionally setaceous and inconspicuous, but more often short and leafy: spikelets ovoid, 2–2.5 mm. long, compact, turgid, 1-fruited with the tubercle of the achene protuberant: scales suborbicular, tightly imbricate, pale: bristles 6, delicate and weakly ascending, upwardly serrulate: achene broadly obovoid, biconvex, 0.7–0.9 mm. wide, 1–1.4 mm. long, gleaming dark brown, with barely discernible rugulosities: tubercle subulate-triangular, 0.4–0.6 mm. long. PLATE 826, FIGS. 3A and 3B; MAP 42.—Pl. Wright. pars 2: 535 (1862), preprint of Mem. Am. Acad. Sci. new ser. viii. 535 (1863); Grisebach, Cat. Pl. Cub. 243 (1866); C. Wright in Sauvalle, Anal. Acad. Ci. Habana, viii. 84 (1871) and Fl. Cub. 179 (1873), excl. syn. *R. scabrata* Griseb.; Clarke in Urban, Symb. Ant. ii. 132 (1900), excl. syn. *R. scabrata* Griseb.; Britton, Mem. Soc. Cubana Hist. Nat. ii. 198 (1916), excl. syn. *R. scabrata* Griseb.—Damp woods or thickets often bordering brooks, mountains of eastern Cuba and northern Dominican Republic. CUBA: in woods, Gato Mts., Cobre Range of Sierra Maestra, alt. 1000 m., *León, Clement & Roca*, no. 10424 (NY); in umbrosis, Loma Mensura, in cacumine montis, Sierra de Nipe, Oriente, alt. 1000 m., *Ekman*, no. 9936 (NY); road to pinal, Mayari Abajo, Aug. 6, 1860,[1] *Wright*, no. 1532 (G, type-number cited without locality by Grisebach); damp banks of stream in thickets, Sierra Nipe near Woodfred, Oriente, alt. 450–550 m., *Shafer*, no. 3438 (NY, US); Camp La Gloria south of Sierra Moa, Oriente, *Shafer*, no. 8084 and no. 8085 (NY); banks of rivulets, prope villam Monte Verde dictam, Jan.–Jul., 1859, *Wright*, no. 1532 (G, NY; type-number cited without locality by Grisebach) and no. 729 (G); *Wright*, no. 3391 (NY, US; also the number of the type-collection of *R. scabrata*). HISPANIOLA: rare, in forest, Loma Quita Espuela, prov. Duarte (formerly Pacificador), Cordillera Septentrional, Santo Domingo, alt. 800 m. *Ekman*, no. 12269 (NY).

39. R. **crispa,** sp. nov. Caespites parvos valde depressos formans; basibus saepe fibrillosis: foliis basilaribus brevibus circinnatis: culmis filiformibus flexilibus ascendentibus 0.2–0.9 dm. altis, fasciculis 1–2 rare 3 parvis laxe spiciformibus; spiculis paucis; fasciculis axillaribus minoribus gracillime pedunculatis: bracteis et squamis imis setose prolongatis: setis 6, subtilissimis inaequalibus quam achaenio saepe longioribus fere laevibus: achaenio obovoideo biconvexo transverse ruguloso pallide castaneo 0.8 mm. lato, 1 mm. longo: tuberculo anguste conico 0.6 mm. longo. PLATE 827, FIGS. 4A and 4B; MAP 43.—Wet rocks of the mountain streams, Sierra Nipe, eastern Cuba. CUBA: in wet crevices of rock subject to overflow, Arroyo del Medio above

[1] See Underwood, Bull. Torr. Bot. Cl. xxxii. 295 (1905).

the falls, Oriente, Dec. 22, 1909, *Shafer*, no. 3266 (NY, TYPE); in pinetis (et carrascales) Sierra de Nipe, Oriente, July 24, 1914, *Ekman*, no. 2171 (NY); banks of upper Sojo River at 600 m. alt. Sierra de Nipe, Oriente, May, 1940, *Carabia*, no. 3731 (G); Pinal Mayari, 700 m. alt. Sierra de Nipe, Oriente, April 7, 1941, *León & Victorin*, no. 19906 (G, in part).

The Ekman sheet, no. 2171, in the Herbarium of the New York Botanical Garden bears the copied annotation "*R. cernua* Gris. det. Kükenthal, 1926." Considering the evident similarity of *R. crispa* and *R. cernua*, it is not strange that Kükenthal failed to distinguish the one from the other. Both form small depressed tufts of curling leaves (although the leaves of *R. crispa* are apparently more tightly and usually inwardly rolled), from which short, capillary, wiry culms arise. Both have characteristically pale spikelets and the stubby ovate achenes with an identical pattern of surface-elaboration. The cymes of *R. crispa*, however, are strictly elongate, and are composed of more or less distant and erect—never crowded and pendulous—spikelets. The long setose subtending bracts pass by gradations into the shorter, less strongly setose, basal scales of the spikelets proper. The upper scales of *R. crispa* appear to be acute with aristulate tips, although from the over-ripe condition of the only available specimens neither this fact, nor the degree of protuberance of the achene from the spikelet can be satisfactorily determined.

The small ovoid congested capituli of *R. cernua*, on the other hand, bear erect to pendulous spikelets, and are exceeded by only 1–2 setaceous bracts at the most, which are sharply differentiated from the poorly developed lower scales. The uppermost scales, beyond which the tubercle and the upper end of the achene protrude, are characteristically emarginate with a short central mucro.

Although the achene of *R. crispa* is of the same shape and size as that of *R. cernua*, it is exceeded by several of the slender bristles and surmounted by an elongate flattened tubercle; whereas the achene of *R. cernua* is short-bristled, with a low conic tubercle.

Shafer's sheet, no. 3266, which I am designating as the TYPE of *R. crispa*, was identified by Britton as *R. Berterii* Clarke (*R. pusilla* Griseb.); but the two species are so utterly different in all but their general size and the bleached appearance of their

spikelets that it is improbable that such a misidentification should reoccur. *R. pusilla* is a lax little plant with flat, soft-textured, spreading leaves which are rarely filiform to 2 mm. wide—very different in appearance from the thick hard-based tufts of *R. crispa* with their strictly filiform subcoriaceous and inwardly coiling leaves.

40. R. SHAFERI Britt. Forming dense, upright tufts: basal leaves capillary, wiry, attenuate, flexuous, ascending; cauline leaves few, attenuate, approximating the height of the culms: culms many, capillary, wiry, flexuous-ascending, 2–3.3 dm. high: cymes solitary, small, loosely spiciform, 3–4 mm. wide, each exceeded by an upright, setaceous bract: spikelets ovoid, sessile, erect or ascending, 1–2-fruited, 2.4–2.6 mm. long; the tubercle and ⅓–½ the achene exposed: scales broadly ovate, pale; the apex rounded, with the midrib slightly, or not at all projecting: bristles 6, not equalling the achene in height, upwardly serrulate: achene slenderly ovoid, lenticular, compressed, transversely rugulose, castaneous, 0.8 mm. wide, 1.3–1.4 mm. long: tubercle conic-subulate, compressed, 0.5 mm. high. PLATE 827, FIGS. 2A and 2B; MAP 44.—Mem. Soc. Cubana Hist. Nat. ii. 197 (1916). *R. lingulata* Kükenthal, Fedde Rep. Spec. Nov. xxiii. 211 (1926).—Thin soil, rocks on banks of mountain streams, Sierra Nipe, eastern Cuba. CUBA: thin soil near base of mountain, Loma Mensura, Oriente, alt. 680 m., *Shafer*, no. 3797 (NY, TYPE; US, ISOTYPE); on the edge of Arroyo Machete, Sierra de Nipe, Oriente, *Ekman*, no. 15121 (NY, this number cited by Kükenthal in type-description of *R. lingulata*); in carrascales-pinetis, Sierra de Nipe, Oriente, *Ekman*, no. 2172 (NY, US; this number cited by Kükenthal in type-description of *R. lingulata*); rocks, bank of stream, Arroyo del Medio above the falls, Sierra Nipe, Oriente, alt. 250–500 m., *Shafer*, no. 4477 (NY); carrascales at Rio Pedra, Sierra, Sierra de Nipe, Oriente, alt. 200–300 m., *Ekman*, no. 19107 (G, US), and same locality, *Ekman*, no. 10010 (G, this number cited by Kükenthal in type-description of *R. lingulata*).

41. R. NIPENSIS Britt. Densely caespitose with thick often heavily fibrous bases: roots coarse, sparingly branched, spongy: radical leaves 1 mm. wide or less, subcoriaceous, flexuous, ascending, approximating the culms in height; the tips flat and blunt, the margins finely serrulate: culms few, slender, erect, 3–3.5 dm. high, bearing 1–2 short, blunt-tipped leaves and terminated by a small ovoid dense capitulum of spikelets: bracts few, short, filiform, divergent: fertile spikelets ovoid, 1-fruited, sessile, ascending to divergent, 2.5 mm. long; the tubercle and upper portion of the achene protruding; sterile spikelets numerous, small, fusiform: fertile scales ovate, short, with rounded

apices: bristles 6, extremely tenuous, loosely ascending, antrorsely serrulate: achene elliptic-ovoid, compressed, often slightly asymmetric, 0.8–0.9 mm. wide, 1.3–1.4 mm. long; surface dull pale brown, transversely rugulose, the rugulosities conspicuously striolate: tubercle seemingly confluent with the apex of the achene, conical-acuminate, 0.6 mm. long. Plate 826, figs. 4A and 4B; Map 45.—Mem. Soc. Cubana Hist. Nat. ii. 197 (1916), non Kükenthal. *R. fibrillosa* Kükenthal, Fedde Rep. Spec. Nov. xxiii. 212 (1926).—Rocks bordering mountain streams of the Sierra Nipe, eastern Cuba. Cuba: rock ravine, dry but subject to overflow after heavy rain, Sierra Nipe, along trail from Piedra Gorda to Woodfred, Oriente, alt. 400–500 m., *Shafer*, no. 3103 (NY, type); ad marginem fluvii Rio Piloto, Sierra de Nipe, Oriente, *Ekman*, no. 3244 (NY, cited by Kükenthal in type-description of *R. fibrillosa*); on rocks of the high cascades of Rio Piloto, Sierra Nipe, Oriente, ca. alt. 700 m., *Ekman*, no. 15173 (NY, cited by Kükenthal in type-description of *R. fibrillosa*); in rock fissures, carrascales at Rio Piloto, Sierra de Nipe, ca. alt. 375 m., *Ekman*, no. 19147 (G, US; cited by Kükenthal in type-description of *R. fibrillosa*).

42. R. cernua Griseb. Depressed, the basal leaves forming dense curly tufts with more or less fibrous bases: leaves filiform, setaceous, wiry, sparingly serrulate, much shorter than the culms: culms filiform, erect, 1–2-leaved, 0.4–2.5 dm. high: inflorescence 1 (rarely 2) small, ovoid capituli 3–4 mm. wide; lateral capituli exserted on long filiform ascending peduncles: spikelets ovate, 1.5–2 mm. long, subsessile, erect to pendant, 1-fruited; the achene and tubercle protruding: scales obovate, notched at the apex, with the midrib slightly prolonged, stramineous to whitish: bristles 6, upwardly serrulate, height variable but falling short of the achene: achene obovoid, biconvex, transversely rugulose, castaneous, 0.8 mm. wide, 1 mm. long: tubercle a stubby cone 0.3–0.4 mm. high. Plate 826, figs. 2A and 2B; Map 46.—Cat. Pl. Cub. 248 (1866); C. Wright in Sauvalle, Anal. Acad. Ci. Habana, viii. 87 (1871) and Fl. Cub. 182 (1873); Clarke in Urban, Symb. Ant. ii. 133 (1900), excl. syn. *R. brevirostris* Griseb.[1]; Britton, Mem. Soc. Cubana Hist. Nat. ii. 197 (1916).—Open places in pineland, mountains of eastern Cuba. Cuba: pinal near Baracoa, Oriente, June 15, 1861?,[2] *Wright*, no. 3413 (G; NY, fragment from Gray Herb. This number cited by Grisebach in type-description); 1860–64, *Wright*, no. 3365 (G. This number cited by Grisebach in type-description); forming small clumps in open places, Sierra Nipe near Woodfred, Oriente,

[1] C. B. Clarke lists *R. brevirostris* in the synonymy of *R. cernua*, due to a misprint in Griseb. which gives the Wright coll. no. of *R. brevirostris* as 3414 (instead of 3410), making it the same as coll. no. of *R. cernua*.

[2] See Underwood, Bull. Torr. Bot. Cl. xxxii. 295 (1905).

alt. 500–650 m., *Shafer*, no. 2995 (NY, in part); same locality, *Shafer*, no. 3048 (NY, US); on bank of stream, Camp La Gloria, south of Sierra Moa, Oriente, *Shafer*, no. 8218 (NY); banks of small stream, Aserrio de Moa, Oriente, *León*, no. 20254 (G).

On a basis of his new species, *R. cernua*, Grisebach[1] drew up the section *Microchaeta* to contain those species which possessed tripartite styles. However, the specimens of *R. cernua* which I have examined have the typically bifid styles. Grisebach's description was probably based upon an anomalous specimen with a tricarpellary gynoecium, a condition which occurs sporadically throughout the Section *Eurhynchospora*.

43. R. **depressa** (Kük.), stat. nov. Growing in depressed tufts: leaves filiform, canaliculate and wiry, erect or somewhat arching with the apices rounded and sparingly serrulate: culms wiry-filiform, subterete or flattened, 1–1.5 dm. high, with 1–2 nodes towards their apices; cymes 1–2, strictly ascending; the terminal cyme limited to 1–2 branchlets each of which bears either a pair of spikelets, the one subsessile, the other slenderly pedicellate, or a central sessile and two lateral pedicellate spikelets; lateral cymes smaller, exsertly pedunculate, erect: bracts attenuate, setaceous, paralleling the culm, serrulate: spikelets 2.2 mm. long, erect, approximate, sessile or slenderly pedicellate, 1-fruited, with the tubercle of the achene slightly protuberant: scales ovate, with the midrib extended slightly from a rounded, emarginate apex, papery, whitish, flecked with cinnamon toward the apex: bristles 6, shorter than the achene, with the fine upward serrulations somewhat prolonged and silvery toward the bases: achene slenderly obovoid, lenticular, biconvex, 0.7 mm. wide, 1.2 mm. long, corrugate with fine longitudinal striae, yellowish-brown: tubercle narrow-based, pike-like, 0.4 mm. long, pale, scurfy. Plate 826, figs. 1A and 1B; Map 48.—*R. Lindeniana* Griseb. ? var. *depressa* Kükenthal, Fedde Rep. Spec. Nov. xxiii. 211 (1926).—Along mountain brooks, eastern Cuba. Cuba: ad marginem rivuli, Minas de Iberia (a Taco Bay), Oriente, *Ekman*, no. 3808 (NY, US. This number cited by Kükenthal in type-description of *R. Lindeniana* var. *depressa*).

R. depressa was described by Kükenthal in 1926 as a provisional variety of *R. Lindeniana* Griseb. Following the brief description the author stated that the specimens at hand were over-ripe and did not permit of a more reliable diagnosis. I have examined two sheets of the original collection, and, after careful comparison of these with specimens of *R. Lindeniana*,

[1] Cat. Pl. Cub. 248 (1866).

believe that Kükenthal's variety is not conspecific with Grisebach's plant. The matted, depressed habit, emphasized by the name, and the dense wiry filiform leaves distinguish the former from both *R. Lindeniana* var. *typica* and var. *bahamensis* (Britt.) Gale.

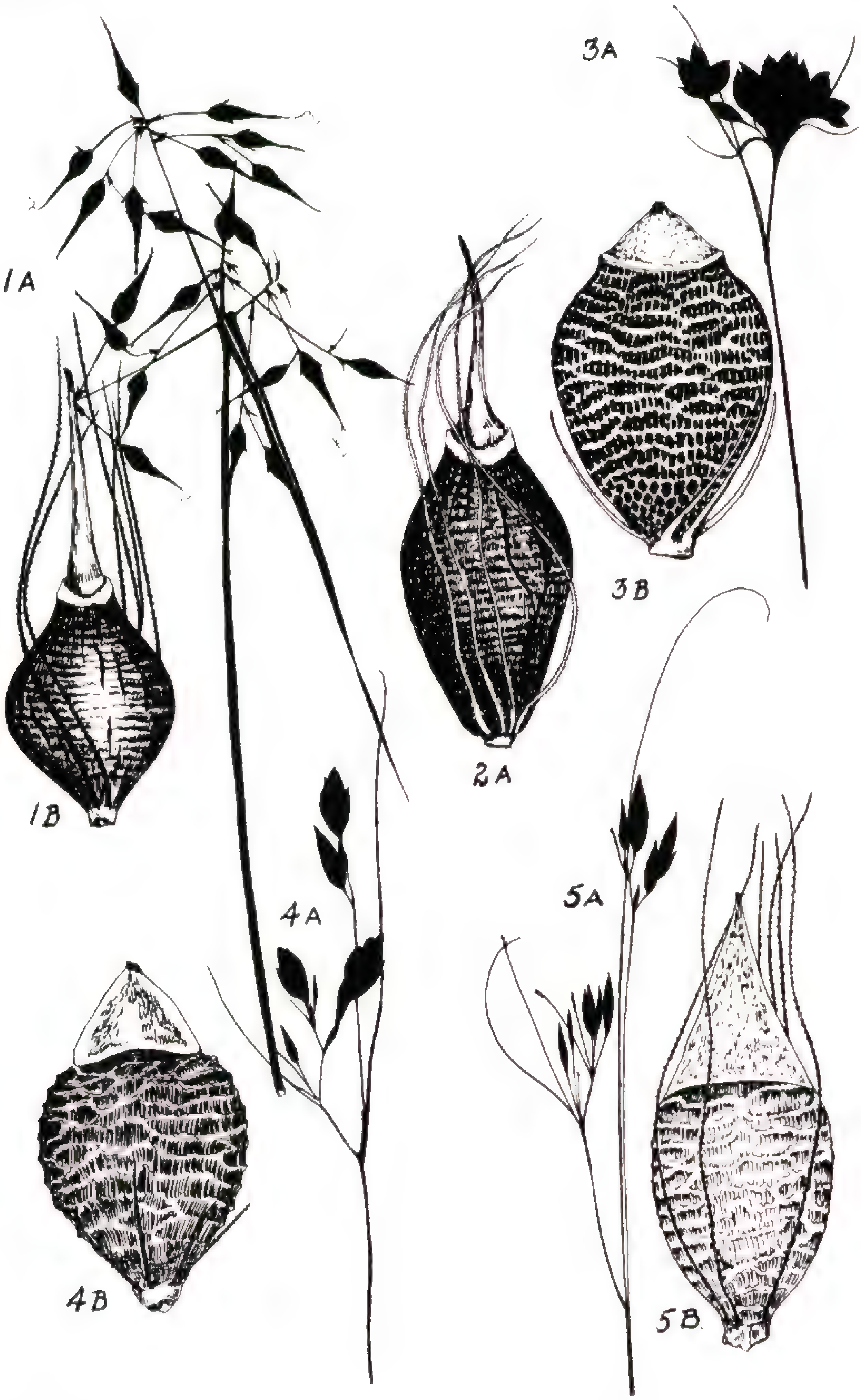
Most fundamental, however, are the differences of inflorescences and achenes. In *R. depressa* the cymes are of few spikelets, delicate, strictly ascending, and the scales are silvery white, flecked with cinnamon, emarginate, with short mucronulate tips. The cymes of *R. Lindeniana,* however, are congested, often irregularly corymbiform, and the scales, although often marginally bleached, are definitely castaneous to dark brown, with rounded or acute apices. The achene of *R. Lindeniana* is ovate to oblong-ovate in outline, plano-convex, indistinctly to finely rugulose, and a glossy dark brown at maturity. The base of the tubercle includes the summit of the achene. The achene of *R. depressa,* however, is obovate and so flattened as to be only slightly biconvex; its surface is banded by a few pale yellowish-brown corrugations. The narrow base of the tubercle of *R. depressa* does not include the summit of the achene, and extends to form a small pike-like projection.

The type-locality, Taco Bay, Oriente, tends to strengthen the argument for the specificity of *R. depressa,* for the high rate of endemism in this province is well-known.

44. R. tenuifolia Griseb. Tufted: basal leaves filiform to 1 mm. wide, short, often curling, triquetrous and sparingly serrulate at the tips: culms filiform, loosely ascending, leafy, 2.4–4.4 dm. high: cymes 2–3, 6 mm. wide or less; the filiform branches erect, approximate, with few spikelets; lateral cymes distant on subexserted peduncles, the lowermost not far from the base of the culm: spikelets lanceolate-acuminate in outline, 3.5–4.5 mm. long, 3-flowered, 1-fruited, erect on slender pedicels: scales slenderly ovate, acute, light brown, papery, loosely imbricate, promptly caducous: bristles 6, pale, extremely delicate, ascending, heavily and upwardly serrulate, exceeding the tubercle: achene slenderly oblong-ovate, strongly flattened, broadly and heavily corrugate with fine longitudinal striae, pale, frequently dark brown in the narrow interstices between the corrugations, conspicuously stipitate, 0.7–0.9 mm. wide, 1.3–1.4 mm. long: tubercle attenuate-subulate, pale, 0.7–0.9 mm. high. Plate 827, figs. 1A and 1B; Map 47.—Cat. Pl. Cub. 244 (1866); non *R. tenuifolia* Benth. (1878); C. Wright in Sauvalle, Anal. Acad. Ci.

S. G. del.

Rhynchospora tenuifolia: fig. 1A, portion of inflorescence, × 2; fig. 1B, achene, × 20.
R. Shaferi: fig. 2A, inflorescence, × 2; fig. 2B, achene, × 20.
R. scabrata: fig. 3A, inflorescence, × 2; fig. 3B, achene, × 20.
R. crispa: fig. 4A, inflorescence, × 2; fig. 4B, achene, × 20.
R. Lindeniana, var. typica: fig. 5A, portion of inflorescence, × 2; fig. 5B, achene, × 20.
R. Lindeniana, var. bahamensis: fig. 5C, achene, × 20.



S. G. del.

RHYNCHOSPORA CUBENSIS: FIG. 1A, portion of inflorescence, × 2; FIG. 1B, achene, × 20.
R. STENOPHYLLOIDEA: FIG. 2A, achene, × 20.
R. CULIXA: FIG. 3A, portion of inflorescence, × 2; FIG. 3B, achene, × 20.
R. RARIFLORA: FIG. 4A, portion of inflorescence, × 2; FIG. 4B, achene, × 20.
R. STENOPHYLLA: FIG. 5A, inflorescence. × 2; FIG. 5B, achene, × 20.

Habana, viii. 86 (1871) and Fl. Cub. 181 (1873). *R. capillacea* sensu Boeckeler, Flora, lxiv. 78 (1881), non Torrey. *R. stenophylla* sensu Britton, Trans. N. Y. Acad. Sci. xi. 92 (1892), in part, non Chapman; Britton, Mem. Soc. Cubana Hist. Nat. ii. 200 (1916), non Chapman. *R. stenophylla* sensu Clarke in Urban, Symb. Ant. ii. 130 (1900), excl. syn., non Chapman. *R. stenophylla* Chapm. var. *albescens* Kükenthal, Fedde Rep. Spec. Nov. xxiii. 211 (1926).—River-banks and moist open woodlands of northwestern Cuba. CUBA: in dense tufts, banks of rivulets San Marcos, jurisdiccion Bahia Honda, Pinar del Rio, Apr. 17, 1863?[1] *Wright*, no. 3393 (NY: US, without locality. This number cited by Grisebach in type-description.)[2]; 1865, *Wright*, no. 313 and no. 315 (NY); in cuabales, Minas, Habana, *Ekman*, no. 13138 (NY); Coca Hill, Campo Florido, Havana, *León*, no. 4733 (NY); in a clearing of a wood, Loma de la Pita, San Miguel de Casanova, Havana, *León*, no. 11547 (NY); very sterile locality, in cuabales towards Canasi, Ceiba Mocha, Matanzas, *Ekman*, no. 18597 (US); Guabal del Espinal south of San Jose station, Matanzas, *León & Roig*, no. 4142 (NY).

Grisebach followed the original description of *R. tenuifolia* with the citation of the Wright numbers 3392 and 3393. The only sheet of number 3392 which I have seen is at the Gray Herbarium. On it are mounted three specimens; the central and largest one is *R. setacea* which Grisebach mentions as growing with *R. tenuifolia*. The other two specimens, which have filiform leaves and culms, are *R. Lindeniana*, easily distinguished from *R. tenuifolia* by the finely rugulose rather than deeply rugose achene.

According to Grisebach, *R. tenuifolia* occurs in both eastern and western Cuba. However, the specimens which I have seen come exclusively from the western half of the island, that is, if the memorandum on Wright's no. 3393 in the Herbarium of the New York Botanical Garden can be taken to apply also to no. 3393 in the National Herbarium. However, the misidentified no. 3392 at the Gray Herbarium is from the vicinity of Baracoa, Oriente, suggesting the possibility that, if the sheet of no. 3392 which Grisebach saw was similarly mixed, the inclusion of eastern Cuba in the range of *R. tenuifolia* is erroneous.

R. tenuifolia Griseb. is the basis of the reports of *R. stenophylla* Chapm. from the West Indies. Although *R. tenuifolia* is very

[1] See Underwood, Bull. Torr. Bot. Cl. xxxii. 297 (1905).

[2] The sheet bearing numbers 3393 and 3392 at the Gray Herbarium consists of two specimens of *R. Lindeniana* Griseb. and one of *R. setacea* Vahl.

like Chapman's species in appearance, both having the caespitose habit, filiform leaves and culms, and small, weakly corymbose cymes of pale pedicellate spikelets, the organization of the spikelets and the appearance of the achenes are strikingly dissimilar. The spikelet of *R. tenuifolia* is 3-flowered, the lowest floret not maturing and the upper remaining rudimentary. The solitary achene, during its growth, forces apart the rather loosely imbricated, promptly caducous scales. The achene itself is slenderly oblong-ovate in outline, strongly flattened, pale, and broadly and heavily corrugate with the cancelli reduced to very fine longitudinal striae. Frequently the narrow interstices between the corrugations are dark brown, the tubercle narrowly attenuate-subulate, and the bristles extremely delicate (as is true in general of the Series *Cernuae*) pale and heavily serrulate.

The spikelet of *R. stenophylla*, however, is usually 1-flowered (rarely 2–3). The solitary achene is tightly enclosed by the persistent scales. The achene, unlike that of *R. tenuifolia*, is ovoid, prominently biconvex, and traversed by abrupt ridges between which occur the oblong cancelli. The surface is uniformly pale, except for two small tongues of whitish spongy tissue which occur, one on either side, at the base. The tubercle is triangular, and the bristles, which are heavier than those of *R. tenuifolia*, are only sparsely serrulate.

45. R. scabrata Griseb. Caespitose: basal leaves tufted, 1.5–2 mm. wide, short, with obtuse to acute tips; margins serrulate; upper surfaces smooth to exasperate; cauline leaves few, short-bladed, ascending to divaricate: culms obscurely triquetrous, slender, flexuous, erect, 2.3–3.8 cm. high: cymes 2–4, corymbiform, small (0.8–1 cm. wide), congested; more loosely organized cymes occurring on later-formed shorter culms; lateral cymes on included peduncles: spikelets ovoid, 3–3.5 mm. long: scales ovate to lanceolate, tightly imbricate, pale to castaneous, papery: bristles 6, extremely delicate, weakly ascending, upwardly serrulate, falling short of the tubercle: achene ovoid-ellipsoid, biconvex, gleaming dark brown, transversely rugulose, 0.9–1 mm. wide, 1.4 mm. long: tubercle attenuate-subulate, whitish, 0.9–1 mm. long.

45a. Var. **typica.** Basal leaves obtusely tipped, 1.5–2 mm. wide; upper surfaces exasperate: scales pale, concealing the tubercle. Plate 827, figs. 3A and 3B; Map 50.—*R. scabrata* Griseb. Cat. Pl. Cub. 243 (1866). *R. Randii* Britt. Mem. Soc. Cubana Hist. Nat. ii. 198 (1916).—Moist, shaded spots, moun-

tains of eastern Cuba. CUBA: pinal of Monte Libano, Oriente, Oct. 7, 1861,[1] and pinal of Mayari, July 24, 1860,[2] *Wright*, no. 3391 (G; NY, US, without locality, this TYPE-NUMBER cited without locality by Griseb.); shaded bank of small stream, Sierra Nipe near Woodfred, Oriente, *Schafer*, no. 3077 (NY, type of *R. Randii* Britt.); Sierra de Nipe, Oriente, *Carabia*, no. 3608 (G); Pinal Mayari, East of Loma Mensura, Sierra de Nipe, Oriente, *León & Victorin*, no. 19934 (G); open pineland, La Casimba, Sierra de Nipe, Oriente, 700 m. alt. *León & Alain*, no. 19241 (G).

Since the publication of Sauvalle's Flora Cubana in 1871, *R. scabrata* has been considered synonymous with the earlier *R. pruinosa* Griseb. This confusion may have had its origin in an unfortunate mixture of both species within the type-material (*Wright*, no. 3391) of *R. scabrata;* for one of Wright's specimens of this number, at the National Herbarium, is undoubted *R. pruinosa*, label and citations to the contrary notwithstanding. And possibly the perpetuation of the confusion may have been due to the superficial similarity existing between the two species. Both are caespitose, often depressed, with a tuft of coarse, flat, basal leaves which are subject to degrees of the same peculiar roughness, and from which arise the slender, triquetrous culms.

The similarity ends, however, with the inflorescence. The cyme of *R. scabrata*, although small, is spreading and corymbiform, and the scales cover the tubercle or, in the case of var. *laevifolia*, the tubercle protrudes but does not extend beyond the lanceolate scales. The cyme of *R. pruinosa*, on the other hand, is glomerulate, ovoid-oblong in shape, and so congested as to simulate a small spike; while the characteristic suborbicular scales of the spikelet are exceeded by the wholly exposed tubercle. Then, too, the pronounced transverse rugulosities on the achene of *R. scabrata* are not at all like the fine almost indistinct sculpturing on the achene of *R. pruinosa*.

Britton apparently followed previous opinion in reducing *R. scabrata* to the synonymy of *R. pruinosa* and, accordingly, the Wright sheet, no. 3391, at New York bears his annotation "*R. pruinosa*." However, for identical material, also collected in Oriente, Britton published the name *R. Randii* which, now that *R. scabrata* is given rightful recognition, becomes a synonym of that species.

[1] See Underwood, Bull. Torr. Bot. Cl. xxxii. 296 (1905).
[2] See Underwood, loc. cit. 295.

45b. Var. **laevifolia,** var. nov. Foliis basilaribus acuminatis, 1.5 mm. latis, supra laevibus vel minute granularibus; squamis castaneis; tuberculis squamas superantibus. Map 51.—Mountains of eastern Cuba. Cuba: moist places, side of trail, Sierra Nipe, along trail Piedra Gorda to Woodfred, Oriente, Dec. 8, 1909, *Shafer*, no. 3098 (NY, type).

The leaves of var. *laevifolia* and var. *typica* are short, approximately 1.5 mm. wide, and basally tufted—identical except in one detail: whereas those of the latter have the peculiar exasperate upper surface, from which the specific name *scabrata* derives, those of the former are smooth or only minutely granular.

It is notable that the achenes of both var. *laevifolia* and var. *typica*, although inseparable, are, at best, very similar to those of *R. Lindeniana*. Possibly the one specimen by which var. *laevifolia* is typified is the result of hybridization between the two very closely related species.

46. R. Lindeniana Griseb. Densely caespitose: leaves lax, setaceous, 1 mm. wide or less, flat, marginally scabrous toward the often rounded apices; cauline leaves long-attenuate, erect: culms obtusely trigonous to subterete, slender to filiform, flexuously ascending, sometimes weak, 1.5 (depressed)–7 dm. tall: cymes 2–5, remote, with few spikelets; uppermost cyme small, congested, corymbiform, with many of the spikelets undeveloped and sterile; lowermost cyme not far from the base of the culm, loosely ascending; axillary bracts slender, equalling or exceeding the height of the cymes: spikelets ovoid to rotund, 2–3.2 mm. long, 1–3-flowered, 1-fruited; the tubercle protruding: lower scales mucronate; upper scales acute to obtuse, papery, castaneous to ferruginous: bristles 6, extremely fragile, weakly ascending, upwardly serrulate, assembled on the flat side of the achene: achene ovate to oblong-ovate in outline, plano-convex, 0.7–0.9 mm. wide, 1.1–1.4 mm. long; surface indistinctly rugulose, glossy, castaneous: tubercle triangular-acuminate or sometimes prolonged and subulate, compressed, whitish, 0.8–1 mm. high.

46a. Var. **typica.** Spikelets ovoid, 3–3.2 mm. long, with the tubercle protruding: scales castaneous, acute: achene ovate in outline, 0.7–0.9 mm. wide, 1.2 (rarely)–1.4 mm. long; tubercle prolonged, subulate, 0.8–1 mm. high. Plate 827, figs. 5A and 5B; Map 52.—*R. Lindeniana* Griseb. Cat. Pl. Cub. 244 (1866); Clarke in Urban, Symb. Ant. ii. 126 (1900), in part var. *bahamensis;* Britton, Mem. Soc. Cubaña Hist. Nat. ii. 196 (1916); Kükenthal, Fedde Rep. Spec. Nov. xxiii. 211 (1926).—Moist woodland in western and eastern Cuba. Cuba: low woods bordering manglares, Toscano, Pinar del Rio, July 29, 1863?[1],

[1] See Underwood, Bull. Torr. Bot. Cl. xxxii. 297 (1905).

Wright, no. 3393[1] (G, in part); 1843–44, *Linden*, no. 1945 (G, ISOTYPE; NY, drawing of no. 1945 from Mus. Bot. Berol. with data "Mt. Lebanon sur les roches endroits couverts alt. 600 f. v. 1844 leg. Linden")[2]; moist bank of trail, Sabanilla to Yamuri Arriba, Oriente, *Shafer*, no. 8428 (NY); Yamuri Arriba to Bermejal, Oriente, *Shafer*, no. 8455 (NY, US); Camp la Gloria, south of Sierra Moa, Oriente, *Shafer*, no. 8086 (NY); Baracoa to Florida, Oriente, *Shafer*, no. 4328 (G, NY, US).

46b. Var. **bahamensis** (Britt.), stat. nov. Similar to var. *typica* in habit, but the spikelets more nearly rotund, 2–2.4 mm. long, with tubercle and achene protruding: scales often ferruginous, usually white-margined; the uppermost blunt: achene oblong-ovate in outline, 0.8 mm. wide, 1.1–1.2 mm. long: tubercle triangular-acuminate, 0.5–0.7 mm. long. PLATE 827, FIG. 5C; MAP 53.—*R. bahamensis* Britton, Torreya, xiii. 217 (1913); Britton, Mem. Soc. Cubana Hist. Nat. ii. 198 (1916); Britton & Millspaugh, Bahama Fl. 55 (1920); Britton & Wilson, Sci. Surv. Porto Rico and Virgin Isl. v. 105 (1923).—Open to shady brook-margins and damp slopes of the Bahamas, eastern and western Cuba, eastern Hispaniola and Puerto Rico. BAHAMAS: along path in coppice, Soldiers Road, New Providence, *Britton & Brace*, no. 588 (NY, TYPE of *R. bahamensis*); vicinity of Blue Hills, New Providence, *Wilson*, no. 8241 (NY, US); mudholes of mangrove swamp, Deep Creek, Andros, *Brace*, no. 5195 (NY). CUBA: in cuabales, Loma de Cajalbana, Pinar del Rio, *Ekman*, no. 12710 (G); dry open place, Loma Pelada de Buena Vista, Cayajabos, Pinar del Rio, alt. 400 m., *León*, no. 13797 (NY); bushy savanna near Loma de la Pita, San Miguel de Casanora, Havana, Dec. 6, 1923, *León* (NY); in humidis, secus Rio Piedra, Sierra de Nipe, Oriente, *Ekman*, no. 1796 (G, NY). HISPANIOLA: very steep open mountainside, M. Bonpere, Gros-Marne, Massif du Nord, Haiti, *Ekman*, no. 4959 (G, NY, US). PUERTO RICO: rocky slopes, Maricao to Monte Alegrillo, alt. 650–750 m., *Britton, Stevens & Hess*, no. 2552 (NY); Rio de Maricao, *Hess*, no. 559 (NY).

The specimens of *R. Lindeniana* which I have studied fall into two groups. That to which the Gray Herbarium isotype, *Linden*, no. 1945, belongs, I am designating as var. *typica*. The other group, var. *bahamensis* (Britt.), includes Britton's species *R. bahamensis*.

Extremely diverse in habit, both varieties range from subdepressed, filiform tufts to robust caespitose clumps. The spikelets

[1] This is the type-number of *R. tenuifolia* C. Wright and as such was obviously misapplied to the specimens on this sheet.

[2] "in scopulosis montis Liban." as cited by Clarke in Urban, Symb. Ant. ii. 126 (1900).

of var. *typica*, however, are ovoid, acute, 3–3.2 mm. long, and 1-fruited. The solitary achene is oblong-ovoid and slender, 1.2 (rarely)–1.4 mm. long, completely enclosed by the castaneous scales, although the tubercle may protrude.

The spikelets of var. *bahamensis*, by contrast, are nearly rotund, 2–2.4 mm. long, and often 2-fruited. Their scales are characteristically stubby and usually white-margined. Beyond them protrudes the upper portion of the ovoid achene which is 1.1–1.2 mm. long.

Series 8. **Cubenses,** ser. nov. Spiculis ovoideis apicem versus tenuiter prolongatis pedicellatis; pedicellis longis, tenuibus, divaricatis vel reflexis: squamis dense imbricatis: achaenio fusco longitudinaliter irregulariter rugoso sive contracto et transverse laevissime ruguloso: tuberculo prolongato.

Growing on damp, usually shaded hillsides, endemic in the West Indies. Coarsely caespitose: bases hard: leaves 2–4 mm. wide: culms slender, flexuous, few: cymes 2–4, compound or decompound; branchlets wiry, filiform, caducous, stiffly divaricate to reflexed, forming a globose network 2.5 cm. wide; lateral cymes on included peduncles: spikelets basally ovoid with a prolonged, acute tip, borne on long, slender, divaricate to reflexed peduncles: scales tightly imbricate: achenes dark brown to black, longitudinally wrinkled as if shrunken, transversely but slightly rugulose: tubercle prolonged.—*Rhynchospora*, Series B. *Diplostyleae*, Sect. 5. *Glaucae* Clarke in Urban, Symb. Ant. ii. 106 (1900), in small part.

Key to Species in Series Cubenses

Achene ovoid, swollen, 1.2–1.4 mm. wide, 1.4–1.6 mm. long; bristles equalling to exceeding the tubercle; species limited to Cuba..47. *R. cubensis*.
Achene rhombic-elliptic in outline, conspicuously flattened, 1–1.2 mm. wide, 1.6–1.8 mm. long; bristles usually shorter than the tubercle; species limited to Hispaniola....48. *R. stenophylloidea*.

47. R. cubensis A. Rich. Coarsely caespitose with hard bases: leaves 2–3 mm. wide, flat, attenuate, loosely ascending, with acutely triquetrous scabrous tips: culms 3-angled, slender, leafy, loosely ascending: cymes 2–4, compound or decompound, the wiry filiform, stiffly divaricate to mainly reflexed branchlets forming a globose network, 2–5 cm. wide; lateral panicles on included peduncles: bracts foliaceous: spikelets basally ovoid with a prolonged acute apex, often split open by the maturing achene, 1-fruited, 5–6 mm. long, solitary on slender divaricate to reflexed pedicels: lower fertile scale ovate-aristate, upper scale lanceolate-acuminate and tightly convolute about the prolonged tubercle,

papery: bristles 6, extremely tenuous, irregularly ascending, upwardly serrulate, equalling to exceeding the tubercle: achene ovoid, swollen, 1.2–1.4 mm. wide, 1.4–1.6 mm. long, dark brown to black, longitudinally wrinkled as if shrunken, especially toward the apex, faintly rugulose from side to side: tubercle 1.1–1.8 mm. long, whitish, encrusted at the base, abruptly narrowed, then stoutly prolonged to a blunt apex. PLATE 828, FIGS. 1A and 1B; MAP 56.—Fl. Cub. Fanerog. ii. 294 (1853); Clarke in Urban, Symb. Ant. ii. 131 (1900), in part *R. stenophylloidea* (Kük.) Gale; Britton, Mem. Soc. Cubana Hist. Nat. ii. 199 (1916), in part *R. stenophylloidea* (Kük.) Gale. *R. deflexa* Grisebach, Cat. Pl. Cub. 243 (1866); C. Wright in Sauvalle, Anal. Acad. Ci. Habana, viii. 84 (1871) and Fl. Cub. 179 (1873).—Damp usually shaded hillsides of eastern and western Cuba. CUBA: in a low wood, north slope of Loma Pelada de Buenavista, Cayajabos, Pinar del Rio, alt. 420 m., *León*, no. 13565 (NY); La Magdalena, Cayamos, Havana, *Boker*, no. 4644 (NY); Baños de Casanova, Loma de la Pita, San Miguel de Casanova, Havana, *León*, no. 12480 (NY); Loma de la Coca, near Campo Florido, Havana, *León*, no. 2939 (NY); along brook, vicinity of Madruga, Havana, *Britton, Britton & Shafer*, no. 709 (NY); edge of creek-bank, dry open serpentine savannah, 10 kilometers west of Santa Clara, Santa Clara, *Howard*, no. 5089 (G, A); deep woods, limestone outcrop, Loma Ventana, Trinidad Mt., Santa Clara, *Howard*, no. 6533 (G, A); grassy shaded hillsides, Jucaral, Cienfuegos Bay, Santa Clara, *Britton & Wilson*, no. 5742a (NY); not uncommon in wet shaded grassy lands, Cieneguita, southwest district of Cienfuegos, Santa Clara, *Combs*, no. 419 (G, NY); Monte Verde, Oriente, Aug. 28, 1859?[1] and Mayari-Abajo, Oriente, *Wright*, no. 3399 (G. This number cited without locality by Grisebach in type-description of *R. deflexa*); in tall clumps, gorge of the Rio Yamuri, Oriente, *Shafer*, no. 7809 (NY); dry, rocky hillsides, Sierra Nipe along trail Piedra Gorda to Woodfred, Oriente, *Shafer*, no. 3315 (NY); hills about Tabajo, base of El Yunque, Oriente, *Shafer*, no. 8370 (NY); prope litus, prope Baracoa ad Navas, Oriente, *Ekman*, no. 3853 (NY).

Grisebach apparently described *R. deflexa* in ignorance of the already existing *R. cubensis* A. Rich. He cited as the type, Wright no. 3399. The Wright sheet of this number at the Gray Herbarium bears two specimens, both of which are *R. deflexa* Griseb. (*R. cubensis* A. Rich.) as labeled; but no 3399 at the National Herbarium, although similarly labeled, bears by some mischance several specimens of the utterly different *R. fascicularis* (Michx.) Vahl, var. *typica*.

[1] See Underwood, Bull. Torr. Bot. Cl. xxxii. 294 (1905).

48. R. **stenophylloidea** (Kük.), stat. nov. In habit identical with *R. cubensis*, caespitose with hard bases: leaves 1.5–2.5 mm. wide, flat, long, slender, flexuous-ascending; the tips triquetrous with serrated angles: culms obtusely 3-angled, 0.3–1 m. high, lax, wiry, often extremely tenuous, with the upper of the long internodes filiform: cymes 2–3, compound to decompound, 1–3 cm. wide, loosely globose, subtended by a foliaceous bract; the wiry filiform branchlets divaricate to reflexed; lateral panicles on subexserted peduncles: spikelet 4–5 mm. long, basally ovoid with a prolonged acute apex, 1-fruited, with no trace of a succeeding rudimentary floret, solitary on slender divaricate to reflexed pedicels: lower fertile scale ovate-aristate; upper scale lance-acuminate and tightly convolute about the prolonged tubercle, papery: bristles 6, extremely fragile and tenuous, irregularly ascending, upwardly serrulate, variable in length, the tallest approximating the tubercle: achene rhombic-elliptic in outline, conspicuously flattened, longitudinally wrinkled as if shrunken, faintly rugulose from side to side, 1–1.2 mm. wide, 1.6–1.8 mm. long: tubercle slenderly conical or slightly compressed, somewhat sunken at the base, whitish, 1–1.6 mm. long. Plate 828, fig. 2A; Map 57.—*R. cubensis* A. Rich., var. *stenophylloidea* Kükenthal, Fedde Rep. Spec. Nov. xxxii. 78 (1933).—Mountainsides on northern coast of Hispaniola. Hispaniola: edge of the Estère, Le Borgue, Massif du Nord, Haiti, Sept. 13, 1925, *Ekman*, no. 4853 (G, US); in sylvestribus ad Jamao, Santo Domingo, alt. 150 m., June 23, 1887, *Eggers*, no. 2600 (NY, US); mountainside, M. Bonpere, Gros-Morne, Massif du Nord, Haiti, c. alt. 800 m., Sept. 30, 1925, *Ekman*, no. 4958 (NY); in fruticetis ad Isabel de Torres, Apr. 23, 1887, *Eggers*, no. 1658 (NY, US).

Kükenthal described *R. cubensis* var. *stenophylloidea* of Hispaniola thus: "Corymbi perparce spiculosi, nux oblonga (haud late ovalis sicut in forma typica) enervis (non longitudinaliter striata), setae hypogynae 3 breves nucem superantes (nec 6 cum nuce aequilongae)." He concluded with "Vielleicht eine gute Art, aber das vorhandene Material reicht nicht aus, um diese Frage zur entscheiden."

According to this description Kükenthal's specimens differed from the material which I am designating as *R. stenophylloidea* with regard both to the bristles and the longitudinal wrinklings on the nut. It is possible, therefore, that Kükenthal's type, *Ekman*, no. 14873, which is not available at the present time, is a different entity. But the fact that this specimen came, as it did, from Hispaniola, to which island my species is apparently

limited, and had a "nux oblonga," described above as rhombic-elliptic but which is in any case larger than that of the typical *R. cubensis*, makes me suspect that the two are conspecific. Possibly three of the six extremely fragile bristles may have broken off at their bases prior to the time of Kükenthal's examination; for when this occurs it is nearly impossible to ascertain their place of previous attachment. Kükenthal's statement as to the comparative length of the bristles is inaccurate, for those of *R. cubensis* equal or even exceed the tubercle in length and are longer than the bristles of the new species. The achenes of the specimens I have examined are, in all cases, more or less longitudinally wrinkled as if shriveled. I cannot suggest why this feature should be absent on the achenes seen by Kükenthal unless they were in this respect atypical.

Series 9. **Harveyae,** ser. nov. Culmis rigide erectis: cymis rigidis vel diffuse fasciculatis vel congestis glomerulosisque: squamis pallidis vel castaneis: spiculis turgidis monocarpis: setis antrorse serrulatis: achaenio saepissime supra tumido, infra compresso fusco leviter alveolato (rare lenticulari ruguso): tuberculo conico; basi haud discoideo sed saepe in achaenii apicem intruso.

Often growing on white sandhills of the Coastal Plain from North Carolina to Florida and west to Texas; inland in the southern and midwestern states; rare in Cuba. Stoloniferous or caespitose: leaves 1.5–7 mm. wide, not filiform: culms stiffly erect: cymes stiff, diffusely fasciculate or congested and glomerulate: scales pale or castaneous: spikelets turgid, 1-fruited: bristles upwardly serrulate: achenes usually tumid above and compressed below, dark mahogany in color, lightly pitted or cancellate in a honey-comb pattern, rarely lenticular and ridged with oblong alveoli: tubercle always grayish or whitish, conical, not projecting at the base but slightly buttressed and overgrown by the summit of the achene.—*Rhynchospora* V. *Glomeratae* Small, Man. 175 (1933), in part. *Rhynchospora*, Series B. *Diplostyleae*, Divisio 5. *Eu-Rhynchospora*, Sect. iii. *Fuscae* Clarke, Kew Bull. Add. Ser. viii. 120 (1908), in part.

Key to Species in Series Harveyae

Spikelets 6–7 mm. long, remote, some if not all slenderly pedicellate; achenes large, 2.8–3.4 mm. wide, 3–4 mm. long. . 49. *R. megalocarpa.*

Spikelets not exceeding 5.5 mm. in length, sessile in small compact glomerules; achenes not exceeding 2.2 mm. in width and 2.4 mm. in length.

Achene suborbicular to broadly ovate in outline, tumid above, compressed below, the entire surface mahogany-brown at maturity.
Spikelets 4–5.5 mm. long; bristles equalling ½ the achene to exceeding the tubercle; achene 1.8–2.2 mm. wide, 2–2.4 mm. long . . . . 50. *R. Grayii.*
Spikelets 2.5–3 mm. long; bristles equalling or shorter than ½ the achene; achene 1.3–1.6 mm. wide, 1.5–1.8 mm. long 51. *R. Harveyi.*
Achene obovate, slenderly lenticular, not tumid, surface crossed by pale irregular transverse ridges . . . . 52. *R. culixa.*

49. R. megalocarpa Gray. Stoloniferous, the bases swollen and covered by short rusty imbricated scales: leaves rigid, subcoriaceous, flat, 4–7 mm. wide, becoming conspicuously channeled, then minutely serrulate on margins and keels: culm obtusely triquetrous, smooth, stiffly erect, 0.3–1 m. high: cymes 2–5, fastigiate to slightly spreading, loose; the terminal cyme 1.6–4 cm. wide, bearing less than 50 plump spikelets singly or in clusters on slender pedicels; lateral cymes on long exserted slender ascending peduncles: spikelets ovoid, plump to bursting, some if not all pedicellate and remote, mainly ascending, 1-flowered, 1-fruited, 6–7 mm. long: scales mucronulate, chestnut-brown: stamens 10–12: bristles 6–8, very tenuous and scarcely thickened at the base, brittle, upwardly hispidulous, falling short of to barely exceeding the achene: achene round-ovoid, turgid in the upper portion, compressed below, 2.8–3.4 mm. wide, 3–4 mm. long, emarginate, mahogany-brown to blackish, glossy excepting where covered with a honey-combed surface-pattern of minute, extremely shallow pits: tubercle buttressed and somewhat encrusted by the summit of the achene, conic-apiculate, grayish or often white, 0.7–1 mm. high. Plate 829, figs. 1A and 1B; Map 58.—Ann. Lyc. N. Y. iii. 208, pl. 6, fig. 16 (1835); Torrey, Ann.. Lyc. N. Y. iii. 368 (1836); Chapman, Fl. So. U. S. 526 (1860); Boeckeler, Linnaea, xxxvii. 606 (1873). *R. dodecandra* Baldwin ex Gray, Ann. Lyc. N. Y. iii. 207, pl. 6, fig. 15 (1835); Britton, Trans. N. Y. Acad. Sci. xi. 90 (1892); Small, Fl. 196 (1903) and Man. 183 (1933). *R. pycnocarpa* Gray, Ann. Lyc. N. Y. iii. 208, pl. 6, fig. 17 (1835). *Phaeocephalum dodecandrum* House, Am. Midland Nat. vi. 202 (1920).—Deep white sand-ridges of the Coastal Plain from North Carolina southward, becoming frequent on the Florida Peninsula; less common west to Mississippi and inland along the Mississippi River (one collection). North Carolina: sand-ridge at Carolina Beach, New Hanover Co., *Godfrey*, no. 4675 (G, NC); Wilmington, New Hanover Co., *Mr. Curtis* (NY, type of *R. pycnocarpa*); near White Lake, Bladen Co., *Oosting*, no. 33630 (D); dry open sand-barrens, 14 miles southeast of Lumberton, Robeson Co., *Wiegand & Manning*, no. 597 (G); sandy depression, Oak Island

off Southport, Brunswick Co., *Blomquist*, no. 5613 (D). SOUTH CAROLINA: excavated area in coarse white sandy pine barren, 5 miles south of Kingstree, Williamsburg Co., *Godfrey & Tryon*, no. 376 (CU, D, G, NY, P). GEORGIA: very dry sand-hills along Fifteen Mile Creek, Emanuel Co., *Harper*, no. 977 (G, NY); common, sand-scrub, Floyd's Island, Okefinokee Swamp, Charlton Co., *J. S. Harper*, no. 700 (G); very dry white sand south of open pond, Decatur Co., *Harper*, no. 1216 (G, NY, US). FLORIDA: Fort George, Duval Co., *Dr. Baldwin* (NY, TYPE); *Baldwin* (NY, type of *R. dodecandra*, immature; annotated by Gray); dry sandy soil near Jacksonville, Duval Co., *Curtiss*, no. 3161 (CU, D, G, P, US); in a scrub, 18 miles north of St. Augustine, St. Johns Co., *O'Neill*, no. 7688 (CU); Palatka, Putnam Co., April, 1869, *Canby* (G, NY); Gainesville, Alachua Co., April 12, 1897, *Crawford* (P); dry sand in scrub, vicinity of Eustis, Lake Co., *Nash*, no. 462 (G, NY, US); Lake Butler, Orange Co., *Beckwith*, no. 556 (US); dry pine barrens, Okeechobee Region, Brevard Co., *Fredholm*, no. 5734 (G, US); in a low pineland, Kissimmee, Osceola Co., *O'Neill*, no. 5121 (CU); scrub near Gadsen Hammock, vicinity of Winter Haven, Polk Co., *McFarlin*, no. 4741 (CA); sand-barrens, Ballast Point, Tampa, Hillsborough Co., March 28, 1923, *Churchill* (G); Dunedin, Pinellas Co., *Tracy*, no. 6995 (G, NY, US); scrub near Sebastian, Indian River Co., *Small, DeWinkler & Mosier*, no. 11120 (NY); in a scrub, 2 miles north of Ft. Pierce, St. Lucie Co., *O'Neill*, no. 7689 (CU); in a scrub, 8 miles east of Lake Placid, Highlands Co., *O'Neill*, no. 7687 (CU); sandy ridge beside stream in pineland, 6 miles east of Manatee, Manatee Co., *Oosting*, no. 170 (D); Indian Mound near Citrus Center, DeSoto Co., *Small*, no. 9914 (NY); flatwoods, Alva, Lee Co., *Hitchcock*, no. 417 (G, NY, US); sterile pine woods, Lantana, Lake Worth, Palm Beach Co., *Curtiss*, no. 5389 (G, NY, US); in scrub-land 9 miles north of Miami, Dade Co., *O'Neill*, no. 7691 (CA, CU); dry sand along the coast, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 860b (G, NY, US); Port St. Joe, Gulf Co., *Eyles*, no. 3723 (CU); in a high hammock, Pensacola, Escambia Co., *O'Neill*, no. 6091 (CU, US). ALABAMA: Fort Morgan, Baldwin Co., *Tracy*, no. 7684 (G, NY, US). MISSISSIPPI: Avondale, Bolivar Co., *Tracy*, no. 4840 (G, NY); moist sandy soil west of bay, Biloxi, Harrison Co., *Pennell*, no. 4388 (NY, P); Cat Island, Hancock Co., *Lloyd & Tracy*, no. 361 (NY).

R. dodecandra Baldwin, *R. pycnocarpa* and *R. megalocarpa* were simultaneously described by Gray in 1835. The type-specimen of the first was admittedly immature; that of the second only somewhat so. A year later, in his revision of the North American Rhynchospora for Dr. Torrey's[1] North Ameri-

[1] Ann. Lyc. N. Y. iii. 368 (1836).

can Cyperaceae, Gray placed *R. pycnocarpa* in the synonymy of *R. megalocarpa* with the remark: "More perfect specimens communicated by Mr. Curtis and Dr. Chapman have enabled us satisfactorily to ascertain that *R. megalocarpa* and *R. pycnocarpa* . . . are different states of the same species." He also added that: "It (*R. megalocarpa*) approaches *R. dodecandra* with which it also agrees in the prevalent number of its stamens."

Twenty-four years later Chapman, publishing his first edition of the Flora of Southern United States, reduced *R. dodecandra* to the status of a synonym under *R. megalocarpa;* and, in so doing, established a precedent for the use of the specific name, *megalocarpa*. However, in 1892, Britton[1], in his list of North American Scirpus and Rhynchospora, gave preference to the specific name, *dodecandra,* and that name has recently come into general use. I have examined the types of *R. pycnocarpa* and *R. dodecandra,* as well as that of *R. megalocarpa.* With the mass of material now available for comparison, they are unquestionably referable to one species. Applying the rules of priority, the name *R. megalocarpa,* as selected by Chapman in 1860, must be reinstated.

50. R. Grayii Kunth. Coarsely tufted: leaves arching, flat, 2–4 mm. wide, smooth, becoming carinate; the upper margins and keel minutely serrulate; the midrib prominent: culms obscurely triquetrous, smooth, stiffly erect, 0.4–7.5 dm. tall, with elongated internodes: the terminal cyme 1–1.5 cm. wide, compounded of 1–3 glomerules of few spikelets on short, erect to spreading peduncles; lateral cymes 1–4, consisting of a single small glomerule on an exserted peduncle: spikelets plumply ovoid, compact, 2–3-flowered, 1-fruited, 4–5.5 mm. long: scales mucronate, sandy to castaneous, tightly imbricate and entire at maturity: stamens 3– (rarely)6: bristles 6, upwardly hispidulous, brittle, varying in length from equalling ½ the achene to exceeding the tubercle: achene suborbicular in outline, tumid toward the summit, with a more or less compressed base, the surface honeycombed with minute shallow pits, mahogany-brown, 1.8–2.2 mm. wide, 2–2.4 mm. long: tubercle conic-apiculate, 0.4–0.6 mm. high, buttressed and partially encrusted by the narrowed apex of the achene. Plate 829, figs. 3A and 3B; Map 54.—Enum. ii. 539 (1837); Chapman, Fl. So. U. S. 526 (1860); Small, Fl. 196 (1903) and Man. 183 (1933); Britton, Mem. Soc. Cubana Hist. Nat. ii. 197 (1916). *R. distans* Elliott,

[1] Trans. N. Y. Acad. Sci. xi. 90 (1892).

Sk. Bot. S. Car. and Ga. i. 59 (1816), non Vahl. *R. Elliottii* Gray, Ann. Lyc. N. Y. iii. 204, pl. 6, fig. 12 (1835), non Dietrich. *Schoenus distans* Muhlenberg, Descrip. Gram. 11 (1817). *Schoenus fuscus* Muhlenberg, Descrip. Gram. 6 (1817). *Phaeocephalum Grayi* House, Am. Midland Nat. vi. 202 (1920). Rare in Virginia (one collection); common southward on sandy pinelands of the Coastal Plain from North Carolina to the tip of Florida and west to eastern Texas; also western Cuba. VIRGINIA: Norfolk, Norfolk Co., *Read* (P). NORTH CAROLINA: Minnesat Beach, near Arapahoe, Pamlico Co., *Oosting*, no. 33208 (D); dry sandy soil near Wilmington, New Hanover Co., *Biltmore Herb.*, no. 239g (CU); dry sandy pine woods, 2 miles southeast of Fair Bluff, Columbus Co., *Wiegand & Manning*, no. 606 (G); pineland at Roseboro, Sampson Co., *Godfrey*, no. 5723 (G); sandhill, 12 miles north of Laurenburg, Scotland Co., *Godfrey*, no. 5044 (D, G); Southern Pines, Moore Co., May 18, 1895, *Blankinship* (G). SOUTH CAROLINA: swampy spots in sandy land along stream, sandhills north of Hartsville, Darlington Co., Mar. 20, 1921, *Norton* (NC); Florence, Florence Co., May 18, 1912, *Bartram* (P); Columbia, Richland Co., May 16, 1912, *Bartram* (P); 10 miles east of Paxville, Clarendon Co., *Godfrey & Tryon*, no. 1018 (G, NY); open, white, sandy oak-pine woods, 1 mile east of Eutawville, Orangeburg Co., *Godfrey & Tryon*, no. 834 (G, NY); sandy open pine woods near Navy Yard, Charleston, Charleston Co., *Robinson*, no. 259 (G). GEORGIA: about Augusta, Richmond Co., June 27–July 1, 1895, *Small* (NY); sandy pinelands at Magnolia Springs, Jenkins Co., *Eyles*, no. 6255 (CU); dry pine barrens near Graymont, Emanuel Co., *Harper*, no. 806 (G, NY, US); dry sand-hills along Big Lott's Creek, Bullock Co., *Harper*, no. 916 (G, NY, US); sand-hill west of Altamaha River on State Route 38, west of Ludowici, Wayne Co., *Eyles*, no. 3159 (CU); dry pine barrens near High Point, Cumberland Island, Camden Co., *Harper*, no. 1538 (G, NY, US); Havana, *Baldwin*, in Gray's handwriting (NY, TYPE); Marshallville, Macon Co., *Earle*, no. 2975 (NY); pine barren, just north of Ashim, Turner Co., *Eyles*, no. 5569 (CU). FLORIDA: dry pine barrens near Jacksonville, Duval Co., *Curtiss*, no. 4801 (G, NY, US); sand-hills, Welaka, Putnam Co., *Laessle*, no. 19 (CU); hammock land, Ormond, Volusia Co., Apr. 11, 1904, *Fuller* (G); bayhead near Eustis, Lake Co., Feb. 4, 1893, *Holm* (G); high pineland, Inverness, Citrus Co., *O'Neill*, no. 5270 (CU); Seminole, Pinellas Co., *Tracy*, no. 7691 (G, NY); ancient sand dunes north of Kuhlman, DeSoto Co., *Small & DeWinkler*, no. 9991 (NY); sandy pine woods near Sebring, DeSoto Co., *Palmer*, no. 2743 (NY); pinelands, Ft. Lauderdale to Miami, Broward and Dade Cos., *Small, Carter & Small*, no. 3368 (NY); in dry sandy soil among palmettos, Buena Vista,

Dade Co., *Moldenke*, no. 607 (D, NY); near Tallahassee, Leon Co., summer, *Berg* (NY); dry pine barrens, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 239a (G, in part; NY, US); DeFuniak, Walton Co., *Tracy*, no. 9010 (G, NY, US). Alabama: Tensaw, Baldwin Co., *Tracy* no. 8028 (G, NY, US); common in woods, Spring Hill, Mobile Co., *Bush*, no. 335 (NY, US). Mississippi: Biloxi. Harrison Co., *Baker*, no. 1129 (NY). Louisiana: *Hale* (G). Texas: Liberty, Liberty Co., Mar. 25, 1892, *Plank* (NY). Cuba: Laguna Los Indios and vicinity, Pinar del Rio, *Shafer*, no. 10820 (NY).

Gray in his monograph pointed out that Elliott's *R. distans*, as described in the Sketch of the Botany of South Carolina and Georgia, is not *Schoenus distans* Michx. on which it was nomenclaturally based. Accordingly Gray designated the former species *R. Elliottii* in commemoration of its discoverer. He then placed in its synonymy two of Muhlenberg's species, *Schoenus distans* and *S. fuscus*, with the explanation that, as the Muhlenberg Herbarium contains no specimen labeled *S. distans*, Muhlenberg probably derived his material from Elliott. *S. fuscus* Muhl., on the other hand, is represented in the herbarium by a specimen labeled "*S. fuscus* Elliott." This, Gray states, is definitely *R. Elliottii* Gray. That Muhlenberg himself apparently suspected *S. distans* and *S. fuscus* to be conspecific (and incidentally that he also perpetuated Elliott's mistaken reference to Michaux's species) is evident from his suggestion, appended to the description of *S. fuscus:* "An *S. distans* Michaux?"

The legitimate name, *R. Grayii*, came from Kunth who, in 1837, on the basis of the priority of Dietrich's *R. Elliottii* 1833, renamed the species in honor of Asa Gray.

51. R. Harveyi Wm. Boott. Caespitose: leaves flat, obscurely carinate, with upper margins finely serrulate, ascending to curly, 1.5–3 mm. wide: culms obtusely triquetrous, stiffly erect, smooth, 0.3–1.1 m. high: terminal cyme 0.8–2.2 cm. wide, usually compounded of 1–4 small glomerules on stiff ascending to spreading peduncles; lateral glomerules 1–2, usually solitary on wiry erect peduncles: spikelets ovoid, turgid, castaneous, 2-flowered, 1-fruited, 2.5–3 mm. long: scales with midribs continuing into conspicuously recurved mucros: stamens 3: bristles 6, delicate, equalling to falling short of ½ the achene, upwardly hispidulous: achene broadly ovate to suborbicular in outline, tumid above, somewhat compressed below, 1.3–1.6 mm. wide, 1.5–1.8 mm. long, rich mahogany-brown when mature; the surface honey-

combed by small shallow isodiametric pits which may be obscured, appearing as faint rugulosities: tubercle squat, conic-apiculate, 0.4–0.5 mm. long, grayish, buttressed by the narrowed apex of the achene. PLATE 829, FIGS. 2A and 2B; MAP 59.—Bot. Gaz. ix. 85 (1884); Small, Man. 183 (1933). *R. Earlei* Britton ex Small, Fl. 197, 1328 (1903) and Man. 184 (1933); Fernald, RHODORA, xxxix, 338 (1937) and xl. 398 (1938). *R. Plankii* Britton ex Small, Fl. 196, 1328 (1903); Small, Man. 183 (1933), in syn. of *R. Harveyi* Wm. Boott. *Phaeocephalum Plankii* House, Am. Midland Nat. vi. 202 (1920). *Phaeocephalum Earlei* House, l. c.—Low or frequently dry open areas in pinelands of the Coastal Plain from southeastern Virginia to Florida and west to Texas; scattered inland stations in the coastal states, in western Tennessee, and on the lower drainage of both the Missouri and Arkansas Rivers, and on the Sabine River. VIRGINIA: argillaceous and siliceous boggy depressions about 3 miles southeast of Petersburg, at head of Poo Run, Prince George Co., *Fernald, Long & Smart*, no. 5647 (G, NY, P); pinelands at western side of Wilcox Lake, Petersburg, Dinwiddie Co., *Fernald & Long*, no. 8596 (G, in part, P); very local, open pineland near Mason's Siding, about 1 mile north of Henry, Sussex Co., *Fernald & Long*, no. 13274 (G); depression in dry open sandy pine and oak thickets near County Line, north of Emporia, Greensville Co., *Fernald & Long*, no. 8114 (G, P). NORTH CAROLINA: moist humus soil, open woodland 4 miles southeast of Wilson, Wilson Co., *Randolph & Randolph*, no. 723 (G); savanna, 1 mile east of Middlesex, Nash Co., *Blomquist*, no. 6358 (D); sandy soil, Cumberland Co., *Biltmore Herb.*, no. 239f (CU); damp sand near brook, Pinehurst, Moore Co., *Wiegand & Manning*, no. 595 (G); Winston-Salem, Forsyth Co., *Denke* in Botanical Science Series, no. 5003 (D). SOUTH CAROLINA: cart-road through pineland-clearing, 5 miles south of Andrews, Georgetown Co., *Godfrey & Tryon*, no. 1371a (G, NY); pine barren, 2 miles west of Pineville, Berkeley Co., *Godfrey & Tryon*, no. 619 (G, NY, P). GEORGIA: Marshallville, Macon Co., *Earle*, no. 2977 (NY, type of *R. Earlei*) and same locality, no. 2976 (NY, annotated as isotype of *R. Earlei*); rather dry pine barrens near Cobb, Sumter Co., *Harper*, no. 2217 (G, NY, US). FLORIDA: 1839, *Torrey* (G). ALABAMA: low pineland, Elberta, Baldwin Co., Aug. 13, 1926, *Wolf* (StB); Mobile, Mobile Co., May, 1845, *Sullivant* (G). TENNESSEE: dry hill, Henderson, Chester Co., *Bain*, no. 244 (G). MISSOURI: ferruginous sandstone glade south of Birdsong, St. Clair Co., *Steyermark*, no. 13416 (Mo). ARKANSAS: Benton Co., 1899, *Plank*, no. 29 (NY, type of *R. Plankii*); Grand Prairie, eastern Arkansas, *Harvey*, no. 2 (G, TYPE). OKLAHOMA: Sapulpa, *Bush*, no. 656 (G, Mo, NY). LOUISIANA: vicinity of Covington, St. Tammany Parish, *Arsène*, no. 11879 (US); along drain in

Seymour Prairie, north of Bastrop, Morehouse Parish, *Brown*, no. 6510 (La); long-leaf pine-hills, north of Pollock, Grant Parish, *Brown*, no. 6458 (La). TEXAS: sandy woods, Mineola, Wood Co., *Reverchon*, no. 2278 (Mo, NY); damp sands, Will's Point, Van Zandt Co., *Reverchon*, no. 2277 (Mo); Angelina Co., *Tharp*, no. 3056 (US); 14½ miles northwest of White Ranch, Chambers Co., *Cory*, no. 22402 (CU, G); 2 miles northwest of Benchley, Robertson Co., *Cory*, no. 21682 (CU); moist sandy soil, Kurten, Brazos Co., *Palmer*, no. 13486 (Mo); low prairie, Hempstead, Waller Co., *Hall*, no. 714 (Mo, NY, US); Alvin, Brazoria Co., Apr. 20, 1894, *Plank* (NY); in wet ditch in red sand on clay subsoil; in railroad right-of-way cut through oak woods just east of Elgin, Bastrop Co., *Innes*, no. 874 (G); ½ mile south of Kicaster School, Wilson Co., *Parks*, no. 18795 (G); Indianola, Calhoun Co., *Ravenel*, no. 139 (NY).

William Boott published *R. Harveyi* in the Botanical Gazette of June, 1884, and cited "Grand Prairie, E. Arkansas, F. L. Harvey, 1883." At the Gray Herbarium are three Harvey collections of this species from this locality. One of these is dated July, 1884, so could not have been the original material seen by Boott. The two remaining specimens are not dated; one is unnamed. The other, however, is labeled *R. Harveyi* in Watson's hand. This I take to be the type, presuming the material collected by Harvey to have been sent to Watson and finally turned over to Boott for study.

The achene of *R. Earlei* Britton ex Small has a low conic tubercle which is uplifted by the narrowed summit of the mahogany-brown achene. These characters, seen in conjunction with the general size of the achene, indicate at once the close relationship of this plant to *R. Harveyi*. Unfortunately *R. Earlei* was published in Small's Manual, and thus appeared without a word of discussion. Nor does its position between *R. Torreyana* and *R. Edisoniana* (*R. microcarpa* Baldw. ex Gray) in the text of that work give an indication that its relationship with *R. Harveyi* was appreciated. In the key, *R. Earlei* is separated from the former by the following character: "achenes transversely wrinkled" as against "achenes cancellate." However, in *R. Harveyi* the shape of the alveoli, on which the degree of wrinkling depends, is subject to considerable variation. Typically, the alveoli are shallow and isodiametric without any accentuation of the transverse walls, but occasionally they are crowded

S. G. del.

RHYNCHOSPORA MEGALOCARPA: FIG. 1A, portion of inflorescence, × 2; FIG. 1B, achene, × 20.
R. HARVEYI: FIG. 2A, portion of inflorescence, × 2; FIG. 2B, achene, × 20.
R. GRAYII: FIG. 3A, portion of inflorescence, × 2; FIG. 3B, achene, × 20.

S. G. del.

RHYNCHOSPORA COMPRESSA: FIG. 1A, portion of inflorescence, × 2; FIG. 1B, achene, × 20.
R. PUNCTATA: FIG. 2A, portion of inflorescence, × 2; FIG. 2B, a hene, × 20.
R. SAXICOLA: FIG. 3A, portion of inflorescence, × 2; FIG. 3B, achene, × 20.
R. OBLITERATA: FIG. 4A, portion of inflorescence, × 2; FIG. 4B, achene, × 20.

into irregular transverse rows and take on narrowly oblong outlines, the shorter horizontal walls of which are then accentuated and appear as fine ridges. More rarely the alveoli are nearly obliterated and the surface becomes as smooth and glossy as that of the achene of *R. megalocarpa* Gray. Earle's specimen from Marshallville, Georgia, was one with a finely ridged achene, and I presume that Britton, in recognizing it as a new species, was unacquainted with the amount of variation in the achenes of *R. Harveyi*.

However, the decompound, somewhat lax cyme of *R. Earlei* does vary from the smaller, stiffly upright, capitate cyme of typical *R. Harveyi*. This larger, looser inflorescence appears to be the only possible basis for segregation. Further collections from Georgia and Florida will be necessary in order to determine whether or not plants which were the basis of *R. Earlei* should receive recognition as a variety of *R. Harveyi*.

52. R. **culixa,** sp. nov. ?Caespitosa: foliis basilaribus 2 mm. latis planis interdum brevibus et crispis; apicem versus leviter carinatis et subtiliter serrulatis; foliis caulinis brevibus: culmis triquetris gracilibus attenuatis erectis, circa 3-foliatis; internodis longis: glomerulo terminali circa 1 cm. lato; glomerulo laterali minore pedunculato; pedunculo erecto: bracteis setaceis brevibus: spiculis late ovoideis tumidis 2-floris 1-carpis 3 mm. longis dense aggregatis: squamis late ovatis, pallide castaneis dense imbricatis; apicibus fissilibus, mucronulatis: setis 6 antrorse serrulatis, achaenio duplo brevioribus aut minus; achaenio lenticulari-obovoideo biconvexo 1.2 mm. lato, 1.4 mm. longo, alveolato fusco; inter alveolas rugis transversis prominentibus pallidis: tuberculo breviter conico, interdum apiculato, 0.3 mm. alto. PLATE 828, FIGS. 3A and 3B; MAP 55.—Rare in southern Georgia and northern Florida. GEORGIA: Irby, Tift Co., Aug. 28, 1890, *Tracy*, no. 1498 (US, TYPE). FLORIDA: *Chapman* (G, in part).

The two specimens which I have designated as *R. culixa* differ from those of *R. Harveyi* Wm. Boott and *R. globularis* (Chapm.) Small, var. *recognita* Gale in the attenuate appearance of their slender culms, in the abbreviated cauline leaves and the compact, unbranched, small, terminal glomerules. Specimens of *R. Harveyi* and *R. globularis*, var. *recognita* are, when well developed, robust, with stiffly erect culms, linear-attenuate cauline leaves and usually compound, stiffly branched ultimately glomerulate cymes.

The achene of *R. culixa* combines characters of both *R. Harveyi* and *R. globularis*, var. *recognita.* It has the unmistakable grayish, squat, conical tubercle of *R. Harveyi* but the achene, like that of *R. globularis*, var. *recognita*, is obovate, lenticular, biconvex, not swollen above, and the transverse walls of the prominent alveoli are accentuated as ridges. However, unlike the ridges on the achene of var. *recognita*, those of *R. culixa* are pale, broader, and developed at the expense of the alveoli which, in the central area, have been rounded and thrown out of the orderly parallel alignment so conspicuous in the achene of var. *recognita.*

Series 10. **Globulares,** ser. nov. Culmis rigide erectis vel rare tenuibus et laxe ascendentibus: cymis saepissime rigidis, glomerulosis vel fasciculatis; cymis lateralibus pluribus: spiculis turgidis, 1–3-carpis: squamis dense imbricatis: setis antrorse serrulatis saepe achaenio duplo brevioribus: achaenio late ovato vel suborbiculato ruguloso vel valde rugoso, cancellato vel striato, emarginato.

Growing in low peaty areas, often in pineland, of the Coastal Plain; inland in the midwestern states; also in the West Indies and Central America. Habit often coarse; leaves never filiform, 1.5–5 mm. broad, often forming a coarse basal tuft: culms usually stiffly erect, rarely slender and loosely ascending: cymes glomerulate or fasciculate, usually stiff: lateral cymes several: spikelets turgid, 1–3-fruited: scales tightly imbricate: bristles upwardly serrulate, often poorly developed: achenes broadly ovate to suborbicular, rugulose to ridged (with the exception of *R. globularis* var. *pinetorum*), cancellate to striate, emarginate, compressed or swollen in the upper portion: tubercle short, basally conical.—*Rhynchospora* V. *Glomeratae* Small, Man. 175 (1933), in part. *Rhynchospora*, Series B. *Diplostyleae*, Sect. v. *Glaucae* Clarke in Urban, Symb. Ant. ii. 106 (1900), in part.

Key to Species in Series Globulares

a. Achene flat or centrally sunken; habit coarse; the basal leaves 4–5 mm. wide....*b.*
  b. Tubercle with a subulate apex rising abruptly from a pronounced basal flange; achene dark reddish-brown..53. *R. compressa.*
  b. Tubercle deltoid-apiculate, the base somewhat decurrent, not projecting; achene castaneous.................54. *R. punctata.*
a. Achene biconvex or somewhat plano-convex, castaneous; habit slender or weak; the basal leaves 4 mm. wide or less....*c.*
  c. Bristles exceeding the achene in height....*d.*
    d. Achene 1.2–1.3 mm. wide, 1.3–1.5 mm. long, the transverse ridges numerous; tubercle depressed, discoid-apiculate....................................55. *R. saxicola.*
    d. Achene 0.8 mm. wide, 0.9 mm. long, the transverse ridges less than 6; tubercle deltoid-compressed......56. *R. sulcata.*

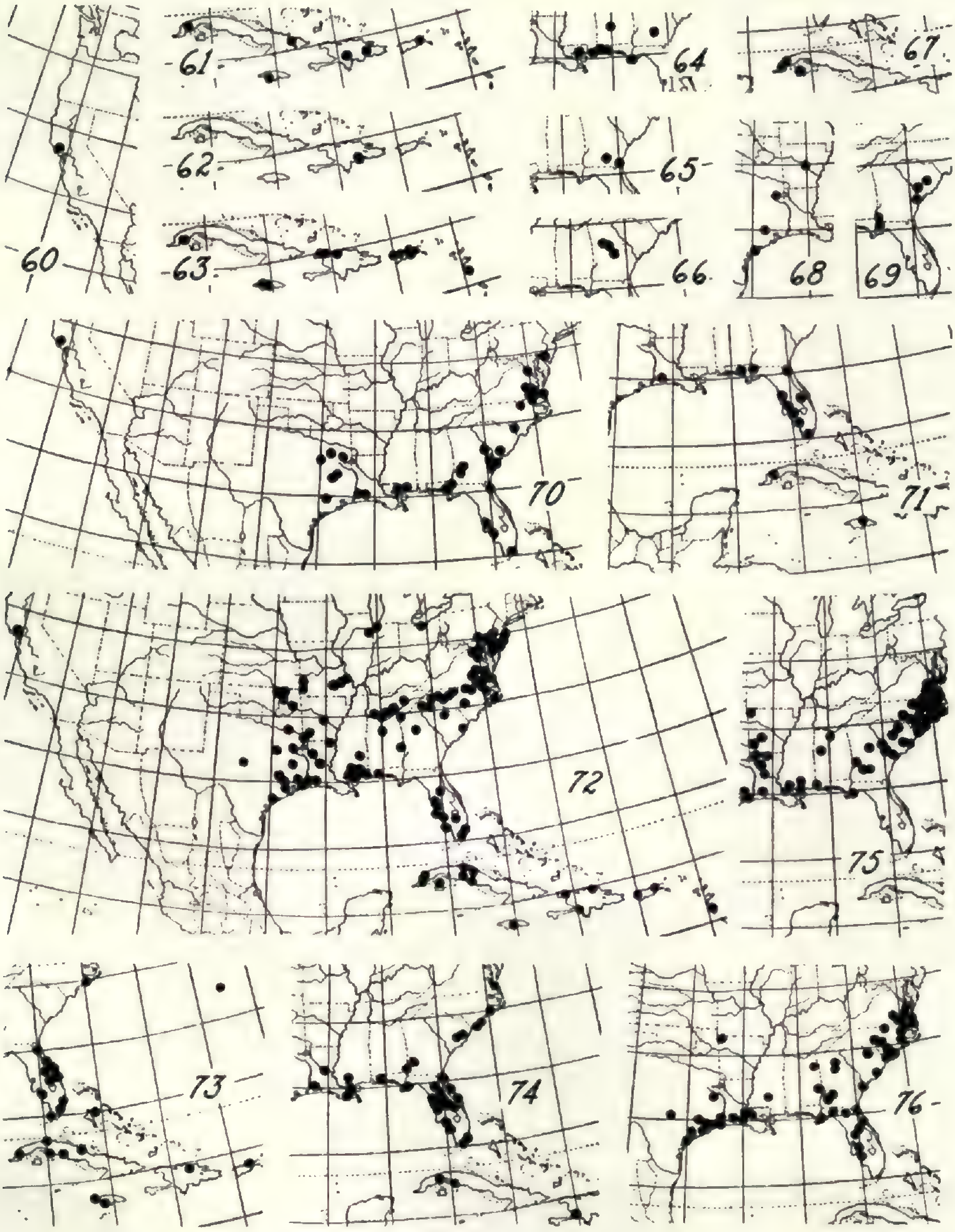
c. Bristles not exceeding ⅔ the achene....*e.*
e. Species limited to western Cuba; achene 0.8 mm. wide, 0.9 mm. long....................................57. *R. Brittonii.*
e. Species continental; achene 1 mm. wide, usually wider, 1.2 mm. long....*f.*
f. Transverse ridges widening, becoming lighter and obscuring the alveoli over the central portion of the achene; spikelets ascending, not more than 6 in small ultimate fascicles..................58. *R. obliterata.*
f. Transverse ridges not widening or becoming light-colored, the alveoli not less distinct over the central area of the achene; spikelets ascending to divergent and numerous in ultimate fascicles or glomerules 59. *R. globularis.*

53. R. COMPRESSA Carey ex Chapman. Caespitose: basal leaves flat, smooth or with margins finely serrulate, 4–5 mm. wide, forming a coarse rigid tuft: culms obtusely trigonous, stiffly erect, leafy, 6.6–9.6 dm. high: cymes 2–4, 1.8–3 cm. wide, densely bracteate, consisting of several glomerules on slender erect to spreading branchlets; lateral cymes remote, exserted on slender erect peduncles: spikelets ovoid, with a slightly irregular contour, 2–3-flowered, 1–2-fruited, castaneous, 3.5–4 mm. long: scales papery; the lowest mucronulate, the others acute: bristles 6, upwardly serrulate, stiff, rarely equalling, never exceeding, the achene: achene obovate to nearly orbicular, 1.4–1.6 mm. wide, 1.4–1.7 mm. long, characteristically flattened, often centrally depressed; the dark reddish-brown surface cancellate and transversely ridged: tubercle compressed-subulate, 0.6–0.8 mm. high, abruptly rising from a conspicuous basal collar. PLATE 830, FIGS. 1A and 1B; MAP 64.—Fl. So. U. S. 525 (1860); Small, Fl. 197 (1903) and Man. 184 (1933); Robinson & Fernald in Gray, Man. ed. 7: 199, fig. 316 (1908). *R. cymosa* var. *compressa* (Chapman) Clarke ex Britton, Trans. N. Y. Acad. Sci. xi. 91 (1892). *Phaeocephalum compressum* House, Am. Midland Nat. vi. 201 (1920).—Low pinelands and swamps, southern Georgia, Florida and west to eastern Louisiana. GEORGIA: flat pine barrens east of Ocilla, Irwin Co., *Harper*, no. 1414 (G, NY, US). FLORIDA: *Carey* (G); low pine barrens, Apalachicola, Franklin Co., *Saurman* (P); Apalachicola, Franklin Co., *Chapman* (NY). ALABAMA: Wilcox Co., May, 1841, *Buckley* (US); brackish swamps, Baldwin Co., June 15, 1893, *Mohr* (NY); Gateswood, Baldwin Co., *Tracy*, no. 8462 (G, US); low pinelands, Point Clear, Baldwin Co., May 11, 1940, *Sargent* (Sargent Herb.); Mobile, Mobile Co., May, 1845, *Sullivant* (G). MISSISSIPPI: Biloxi, Harrison Co., *Tracy*, no. 4883 (NY, US); in low pine barrens, Pass Christian, Harrison Co., June 26, 1885, *Langlois* (CU); Ocean Springs, Jackson Co., May 9, 1895, *Skehan* (G, US). LOUISIANA: vicinity of Covington, St. Tammany Parish *Arsène*, no. 11750 (NY, US).

Old records from Missouri were based on misidentifications.

54. R. punctata, Ell. Caespitose, with a large clump of coarse basal leaves: leaves 5 mm. wide, carinate, becoming triquetrous at the tip, with setaceous margins: cauline leaves short, erect: culms stiffly erect, triquetrous, smooth, approximately 7.6 dm. high: cymes 4, decompound, the stiff wiry ascending branchlets of varying lengths and terminating in small glomerules; terminal cymes 4 cm. wide; lateral cymes smaller, on long slender ascending peduncles: spikelets ovoid, 5 mm. long, approximately 4-flowered, 1–2-fruited: scales pale chestnut, frayed; the midribs of the lower scales free at their tips and slightly projecting: bristles 6, equalling ½ the tubercle in length, upwardly hispidulous, ascending: achene obovate to suborbicular in outline, extremely compressed, cancellate, with fine transverse rugulosities, pale chestnut, 1.8 mm. wide, 2.2 mm. long: tubercle deltoid-apiculate, compressed, pale, 0.9 mm. high. Plate 830, figs. 2A and 2B; Map 65.—Sk. Bot. S. Car. and Ga. i. 60 (1816); Gray, Ann. Lyc. N. Y. iii. 203, pl. 6, fig. 11 (1835); Chapman, Fl. So. U. S. 526 (1860); Small, Fl. 198 (1903) and Man. 185 (1933). *Phaeocephalum punctatum* House, Am. Midland Nat. vi. 202 (1920).—Wet pine parrens, southern Georgia and northern Florida. Georgia: wet pine barrens, about 1 mile southeast of Douglas, Coffee Co., *Harper*, no. 2200 (G, NY, US). Florida: St. Mary's, *Baldwin* (NY); "St. Mary's & Savan," *Baldwin* (P).

55. R. saxicola Small. Caespitose: basal leaves forming a coarse curly tuft; cauline leaves 1.5–3 mm. wide, harsh, mostly erect, flat, becoming trigonous near the summit; margins finely serrulate: culms triquetrous, slender, erect, short, 2.6–3 dm. high: inflorescence of 2–4 cymes; the terminal one 1.3–2 cm. wide, with a few slender erect branchlets bearing small clusters of sessile spikelets: bracts short, inconspicuous: scales tightly imbricate, castaneous; lowermost mucronate and usually split: spikelets ovoid, turgid, 3-flowered, 1–2-fruited, sessile, 3.5–4 mm. long: bristles 6, fragile, well exceeding the tubercle, upwardly serrulate: achene obovoid, compressed except for the slightly swollen region of the umbo, finely cancellate, ridged, castaneous, 1.2–1.3 mm. wide, 1.3–1.5 mm. long: tubercle depressed, conic-apiculate, with a discoid base, 0.2–0.3 mm. high. Plate 830, figs. 3A and 3B; Map 66.—Man. 185, 1503 (1933).—Granite outcrops in the Piedmont of Georgia. Georgia: boggy slope on south side of Little Stone Mt., DeKalb Co., *Harper*, no. 2308 (NY, type; US, isotype), and no. 2309 (NY); dry thickets on flat granite rocks, 1 mile east of Logansville, Walton Co., *Pyron & McVaugh*, no. 549 (US); shallow soil about granite outcrops, 9 miles southeast of Greensboro, Greene Co., *McVaugh*, no. 5328 (USNA); shallow soil about granite outcrops, 4 miles southeast of Sparta, Hancock Co., *McVaugh*, no. 5345a (USNA).



Range of 60, Rhynchospora californica; 61, R. Marisculus; 62, R. cacuminicola; 63, R. rugosa; 64, R. compressa; 65, R. punctata; 66, R. saxicola; 67, R. Brittonii; 68, R. obliterata; 69, R. sulcata; 70, R. globularis, var. typica; 71, R. globularis, var. pinetorum; 72, R. globularis, var. recognita; 73, R. odorata; 74, R. miliacea; 75, R. inexpansa; 76, R. caduca

The habit of *R. saxicola* has little to distinguish it from that of *R. globularis* (Chapm.) Small, var. *typica*. However, its spikelets are usually a millimeter longer and tend to be erect in clusters, rather than erect to divergent in glomerules or fascicles. The most obvious character by which to separate the achene of *R. saxicola* from that of *R. globularis*, var. *typica* is, as emphasized in the key, the comparative length of the bristles. Those of *R. saxicola* are 6 in number, and, although extremely frail and apt to be broken off, do, when entire, exceed the achene and often the tubercle. Those of the former, however, rarely equal ½ the achene in height. The alveoli of *R. saxicola* also differ from the usually dull alveoli of *R. globularis*, for the former are so narrowly oblong as to appear merely as fine glistening striae running between the transverse wrinkles. The "depressed conic or disc-like tubercle", as described by Small, is not too dependable a character; for, although the average tubercle of *R. globularis* is short and conical, it may less frequently be depressed and even basally discoid.

R. saxicola is peculiar in being strictly limited, so far as is known, to margins of shallow ephemeral pools on the granite outcrops in the Piedmont of Georgia.

56. R. **sulcata,** sp. nov. Planta caespitosa: foliis 1–2.5 mm. latis laxis planis; apicibus trigonis: culmis 3.6–6.5 dm. altis gracilibus fere teretibus laxis; internodis longis: inflorescentia culmi longitudinis ¾ aequanti; paniculo terminali 2.5 cm. lato; ramulis debilibus filiformibus ascendentibus vel patulis; glomerulis terminalibus parvis; paniculis lateralibus distantibus; pedunculis brevibus exsertis ascendentibus: spiculis rotundo-ovoideis turgidis 1–6-carpis 3 mm. longis: squamis fere orbicularibus castaneis deciduis: setis 6 fragilibus, achaenio aequalibus, antrorse et minute serrulatis: achaenio parvo (0.8 mm. lato 0.9 mm. longo) subgloboso nitido castaneo profunde transverse sulcato; sulcis valde longitudinaliterque striolatis: tuberculo compresso-deltoideo albescente 0.2 mm. alto. Plate 831, figs. 3A and 3B; Map 69.—Infrequent along streams, on pond-shores, and in low places of the Coastal Plain from Southern South Carolina to northern Florida. South Carolina: damp soils, Santee Canal, Berkeley Co., Sept., *Ravenel* (G); sedge-meadow at Bostick Pond near Allendale, Allendale Co., Aug. 5, 1939, *Eyles*, no. 6465 (CU). Georgia: pond near Luciene Bay, Effingham Co., July 25, 1939, *Eyles*, no. 6378 (G, type; CU, isotype); sandy shore of Open Pond, Decatur Co., Aug. 12,

1901, *Harper*, no. 1204 (G, NY, US). FLORIDA: Quincy, Gadsden Co., *Chapman* (NY, in part); Tologee Creek, in John Carey's handwriting (G).

R. sulcata is closely related to both *R. Brittonii* Gale of Cuba and *R. microcarpa* Baldw. ex Gray of the southern United States and the Greater Antilles. The danger of confusion with *R. Brittonii* is small due to the geographical separation of the two species, but the similarity in habit is so striking as to deserve a short discussion. Both species have in common slender flexuous culms which customarily bear small cymes at every node including the first. The lax branchlets in *R. sulcata* are, however, spreading to divergent so that, as a result, its panicles do not have the somewhat congested appearance of the inflorescence, with spikelets borne on the mainly ascending branchlets, of *R. Brittonii.* The achenes of *R. Brittonii* are slightly larger than those of *R. sulcata.* Both are ridged, but those of the latter more abruptly so and with the concomitant grooves deeper. Lastly, the 5–6 bristles surrounding the achene of *R. Brittonii* are short, not exceeding ½ its height; whereas the achene of *R. sulcata* is surrounded by 6 bristles which equal it in height.

R. microcarpa, on the other hand, is found within the range of *R. sulcata*, and in its smaller attenuated specimens simulates the typical habit of the latter. In *R. sulcata*, however, as mentioned above, the second, if not the first, node of the culm bears the first lateral panicle, so that the inflorescence occupies ⅔–¾ the length of the culm. In *R. microcarpa* the first, second, usually the third, and often the fourth nodes are barren, and the inflorescence occupies only the upper ¼, rarely ½ the culm. A comparison of the sculpturing on the surface of the achenes of the two species is even more conclusive, for that of the new species is emphatically ridged, whereas that of *R. microcarpa* is typically pitted, with the transverse walls only rarely accentuated so as to produce a rugulose effect.

57. R. **Brittonii,** sp. nov. Planta caespitosa: foliis 1 mm. latis aut minus, planis, apicem versus trigonis et minute serrulatis: culmis vel obtuse trigonis gracilibus vel filiformibus teretibusque, flexilibus, 2.8–5 dm. altis: paniculo terminali decomposito, leviter congesto, 0.8–1 cm. lato; ramulis ascendentibus vel divergentibus; paniculis lateralibus exsertis pedunculatis: spiculis rotunde ovoideis, turgidis, 3–5-floris, 2–4-carpis, 2–2.5 mm.

longis: squamis fere orbiculatis dense imbricatis fuscis: setis 5–6 achaenio duplo brevioribus, antrorse et minutissime serrulatis: achaenio subhemisphaerico, parvo (1 mm. lato, 1 mm. longo) inter rugas paucas profundas transversas longitudinaliter striolato: tuberculo compresso-deltoideo, 0.2 mm. alto. Plate 831, figs. 2A and 2B; Map 67.—Borders of lagoons, Isle of Pines and western Cuba. Cuba: savanna, San Pedro and vicinity, Isle of Pines, Feb. 12–Mar. 22, 1916, *Britton & Wilson*, no. 14301 (NY, US); shore of Laguna de Junco, Pinar del Rio City, Pinar del Rio, Oct. 31, 1923, *Ekman*, no. 17862 (US); lagoon in savanna, vicinity of Pinar del Rio City, Pinar del Rio, Mar. 8–15, 1911, *E. G. Britton*, no. 10023 (NY, type; US, isotype); dryish sand, Laguna Jovero and vicinity, Pinar del Rio, Dec. 12, 1911, *Shafer*, no. 1090 (NY); border of lagoon, vicinity of Pinar del Rio City, Pinar del Rio, Sept. 5–12, 1910, *Britton, Britton & Gager*, no. 6946 (NY); Laguna de la Maguina, south of Pinar del Rio City, Pinar del Rio, Nov. 28, 1940, *León & Alain*, no. 19410 (G).

This species has been named in honor of Dr. Nathaniel Lord Britton. It is most closely related to *R. sulcata* Gale, and the discussion of the two species follows the description of the latter.

58. R. **obliterata,** sp. nov. Planta caespitosa: foliis 1.5–2 mm. latis planis setaceis ascendentibus; marginibus sparse serratis: culmis trigonis gracilibus, 5.9–9.2 dm. altis, apicem versus flexuosis: fasciculis 2–3 decompositis corymbiformibus 2–3 mm. latis; lateralibus compositis minoribus erectis pedunculatis exsertis: spiculis ovoideis, 1–3-floris, 1–2-carpis, 3.5–4 mm. longis: squamis aristulatis, laxe imbricatis: setis 6, achaenio duplo brevioribus vel saepe rudimentariis, antrorse serrulatis: achaenio late lenticulari-obovoideo biconvexo 1.2–1.3 mm. lato 1.2–1.3 mm. longo nitido castaneo; alveolis in medio a rugis validis pallidis transversis obscuratis: tuberculo depresso apiculato 0.3 mm. alto. Plate 830, figs. 4A and 4B; Map 68.—Borders of ponds in Arkansas and southeastern Texas. Arkansas: borders of ponds, E. Ark.[1] July, 1884, *Harvey*, no. 12 (G). Texas: Cypress City, Harris Co., Aug., 1877, *Boll*, no. 793 (Mo); ponds, Hempstead, Waller Co., April 16, 1872, *Hall*, no. 709 (G, type; Mo, NY, US, isotypes); prairie near Indianola, Calhoun Co., May 30, 1869, *Ravenel*, no. 144 (NY, in part *R. globularis* (Chapm.) Small, var. *recognita* Gale).

The specimens of *R. obliterata* cited above were segregated from collections of *R. globularis* (Chapm.) Small, var. *recognita* Gale (*R. cymosa*). They differ in general from the latter species

[1] Located on the map as in the vicinity of Grand Prairie.

S. G. del.

Rhynchospora globularis, var. typica: fig. 1A, portion of inflorescence, × 2; fig. 1B, achene, × 20.

R. Brittonii: fig. 2A, portion of inflorescence, × 2; fig. 2B, achene, × 20.

R. sulcata: fig. 3A, portion of inflorescence, × 2; fig. 3B, achene, × 20.

R. globularis, var. recognita: fig. 4A, portion of inflorescence, × 2; fig. 4B, achene, × 20.

R. globularis, var. pinetorum: fig. 5A, achene, × 20.

both in their cauline leaves, which are narrower and setaceous, and in their lack of a coarse, curling tuft of basal leaves. The inflorescence of *R. obliterata* is loosely fasciculate. The numerous small clusters of spikelets, each borne on a flexuously ascending branchlet, are inconspicuously bracteate. The inflorescence of *R. globularis* var. *recognita*, on the other hand, has comparatively short, stiffly erect to divergent branchlets bearing tight ultimate corymbs or glomerules which are penetrated by short stiff bracts. The lenticular achene of *R. obliterata* has a precise, broad-obovate outline. The transverse walls of the alveoli are aligned and pushed up into small ridges which, over the central portion of the achene, become conspicuously wider and paler, obscuring the alveoli. The achene of *R. globularis* var. *recognita* is by contrast irregularly obovate to suborbicular in outline, and tends to be more tumid above. Its small ridges are evenly continued across the face of the achene, and the alveoli of the central portion remain undiminished in size. The name of the new species derives from the characteristic blotting out of the central alveoli.

59. R. GLOBULARIS (Chapm.) Small. Caespitose, with a tuft of coarse often curling basal leaves: leaves 1.5–4 mm. wide, flat; the edges finely serrulate; tips triquetrous: culms trigonous to subterete, 1.4–9.2 dm. tall, robust and stiffly erect to slender, attenuate and flexuous: cymes 1–4, rarely 5; the branchlets rigid, short and spreading or contracted, terminating in capituli: spikelets broadly ovoid to nearly rotund, turgid, 1–3-fruited, 2.5–4 mm. long: scales papery, tightly involute; the lowermost suborbicular, commonly split at the apex, blunt or mucronate: bristles 5–6, not exceeding ⅔ the achene in height, upwardly serrulate: achene broadly obovoid to subglobose, tumid above, compressed below, cancellate, transversely ridged to rugulose, castaneous, 1–1.5 mm. wide, 1.2–1.6 mm. long: tubercle conical, with or without a compressed apex, 0.3–0.6 mm. high.

KEY TO VARIETIES OF R. GLOBULARIS

Achenes transversely ridged or rugulose, their cancelli oblong.
Habit frequently depressed; branchlets of the cymes terminating in small knobby glomeruli; bracts inconspicuous; spikelets 2.5–3 mm. long; achenes 1–1.2 mm. wide, 1.2–1.3 mm. long, finely cancellate, transversely ridged to rugulose 59a. var. *typica*.
Habit robust; branchlets of the cymes usually terminating in dense glomerules; setaceous bracts conspicuous; spikelets 3–4 mm. long; achenes 1.2–1.5 mm. wide, 1.3–1.6 mm. long, coarsely cancellate to striate, transversely ridged. . 59b. var. *recognita*.
Achenes flat-surfaced except for a faintly raised isodiametric reticulation . . . . 59c. var. *pinetorum*.

59a. Var. **typica.** Leaves 1.5–2 mm. wide: culms often short, but ranging from 1.4–6.8 dm. in height, slender, obtusely trigonous to subterete, often attenuate, wiry and flexuous: branchlets of the cymes terminating in small knobby capituli of 3–8 spikelets: bracts inconspicuous: spikelets 2.5–3 mm. long, 1–2-fruited: bristles 5 (rarely 6), usually less than ½ the achene in height: achene finely cancellate, transversely ridged to rugulose, 1–1.2 mm. wide, 1.2–1.3 mm. long: tubercle short, conical. Plate 831, figs. 1A and 1B; Map 70.—*R. globularis* Small, Man. 184 (1933). *R. cymosa* var. *globularis* Chapman, Fl. So. U. S. 525 (1860); Britton, Trans. N. Y. Acad. Sci. xi. 91 (1892); Small, Fl. 197 (1903); Fernald, Rhodora, xxxvii. 380, 405 (1935) and xxxix. 391, 480 (1937).—Sandy or peaty depressions from Delaware south along the Coastal Plain to the tip of Florida and west to eastern Texas; inland to the upper Sabine and the Red Rivers; also in swamps of the coastal ranges of northern California. Delaware: swamps, Newport, New Castle Co., July 12, 1863, *Commons* (NY). Virginia: ledges along Potomac River, Great Falls, Fairfax Co., *Blake*, no. 5277 (US); low woodroad north of Savedge, Surry Co., *Fernald & Long*, no. 8121 (G, P); sandy and peaty depression (exsiccated shallow pond) about 4 miles northwest of Homeville, Sussex Co., *Fernald & Long*, no. 6071 (G, P); wet argillaceous depressions south of Petersburg, Dinwiddie Co., *Fernald & Long*, no. 8120 (G, P); peaty and argillaceous clearing about 4 miles southeast of Emporia, Greensville Co., *Fernald & Long*, no. 8122 (G, P); near Northwest, Norfolk Co., *Kearney*, no. 1536 (US); sandy barrens, Rifle Range, south of Rudy Inlet, Princess Anne Co., *Smith & Hodgdon* in Pl. Exsic. Gray., no. 625 (CU, G, NY, P, US). North Carolina: argillaceous-siliceous clearing, 2 miles east of Conway, Northampton Co., June 14, 1939, *Godfrey*, (CU, D, G, P); open pine woods, acid soil, south of Bennett Memorial, Durham Co., *Blomquist*, no. 9799 (CU, D); damp thickety school yard, 7 miles east of Lumberton, Robeson Co., *Wiegand & Manning*, no. 614 (G). South Carolina: sand pit, Combahee River, south of Hendersonville, Colleton Co., *Wiegand & Manning*, no. 617 (G). Georgia: Smithville, Lee Co., *Earle*, no. 2979 (NY); low grounds between Millen and Ogeechee River, Burke Co., *Harper*, no. 792 (G, US); rather dry sandy roadside in pine barrens, Bullock Co., *Harper*, no. 880 (G, NY, US); margins, Bouhin's Pond, Chatham Co., *Eyles*, no. 6093 (CU); ditch along U. S. Route 17 south of Ways, Bryan Co., *Eyles*, no. 6286 (CU); dry open sink between Newton and Elmodel, Baker Co., *Eyles*, no. 7067 (Hermann Herb.). Florida: near Jacksonville, Duval Co., *Curtiss*, no. 4105 (US); Manavista, Manatee Co., *Tracy*, no. 6991 (US); in moist sandy ditch along roadside, Rialto, Lee Co., *Moldenke*, no. 1011 (US); in hammocks and pine lands, Black

Point, below Cutler, Dade Co., *Small & Carter*, no. 880 (NY); Chipola River swamp, Jackson Co., *Curtiss*, no. 3 (G); swampy thicket, Washington Co., *Curtiss*, no. 3149 (CU, P, US). MISSISSIPPI: Picayune, Pearl River Co., May 24, 1940, *Sargent* (Sargent Herb.). LOUISIANA: in grassy soil, Covington, St. Tammany Parish, July 17, 1884, *Langlois* (CU); low prairies, Jennings, Jefferson Davis Parish, *Palmer*, no. 7624 (CA); infrequent, low prairies, vicinity of Lake Charles, Calcasieu Parish, *Mackenzie*, no. 400 (NC, NY). TEXAS: common in swamp, Big Sandy, Upshur Co., *Reverchon*, no. 2460 (Mo, NY); damp places, Dallas, Dallas Co., *Reverchon*, no. 3603 (G, US); wet sandy ground, Jacksonville, Cherokee Co., *Palmer*, no. 7905 (CA, Mo, P); springy places north of Palestine, Anderson Co., June 8, 1899, *Eggert* (Mo); low prairie, Hempstead, Waller Co., *Hall*, no. 712 (NY, US). CALIFORNIA: Pitkin Marsh, 5 miles north of Sebastopol, Sonoma Co., *Howell*, no. 12678 (G).

59b. Var. **recognita,** nom. nov. Leaves 2–4 mm. wide: culms 1.5 (rarely)–9.2 dm. in height, robust, trigonous and erect to attenuate, obscurely trigonous and flexuous: terminal capituli usually heavily crowded with spikelets: the pale bracts usually conspicuous: spikelets consistently larger than those of var. *typica*, 3–4 mm. long, 1–3-fruited: bristles 5–6, ½–⅓ height the achene in length: achene coarsely cancellate to striate, transversely ridged, 1.2–1.5 mm. wide, 1.3–1.6 mm. long: tubercle 0.5–0.6 mm. high, conic to triangular, with the apex compressed. PLATE 831, FIGS. 4A and 4B; MAP 72.—*R. cymosa* sensu Torrey, Fl. N. and Mid. St. no. 1: 56 (1823) and later authors to the present; Gray, Ann. Lyc. N. Y. iii. 196, pl. 6, fig. 1 (1835); Torrey, Ann. Lyc. N. Y. iii. 364 (1836); Gray, Man. 532 (1848); Chapman, Fl. So. U. S. 524 (1860); Britton, Trans. N. Y. Acad. Sci. xi. 91 (1892), excl. syn. *R. Harveyi* Wm. Boott (*R. Harveyana* in error); Britton & Brown, Ill. Fl. i. 280, fig. 658 (1896); Clarke in Urban, Symb. Ant. ii. 129 (1900), excl. syn.; Britton, Man. 186 (1901); Small, Fl. 197 (1903) and Man. 184 (1933); Robinson & Fernald in Gray, Man. ed. 7: 199, fig. 315 (1908); Britton, Mem. Soc. Cubana Hist. Nat. ii. 198 (1916); Britton & Wilson, Sci. Surv. Porto Rico and Virgin Isl. v. 104 (1923); non Elliott. *R. gracilis* sensu Grisebach, Cat. Pl. Cub. 243 (1866), in part; C. Wright in Sauvalle, Anal. Acad. Ci. Habana, viii. 84 (1871) and Fl. Cub. 179 (1873), in part; non (Swartz) Vahl. *R. Torreyana* sensu Grisebach, Cat. Pl. Cub. 243 (1866); C. Wright in Sauvalle, Anal. Acad. Ci. Habana, viii. 84 (1871) and Fl. Cub. 179 (1873); non Gray. *Schoenus cymosus* Muhlenberg, Cat. 6 (1813), *nomen nudum*, and Descrip. Gram. 8 (1817); non Willdenow. *Phaeocephalum cymosum* House, Am. Midland Nat. vi. 201 (1920). *Dichromena cymosa* Macbride, Field Mus. Pub. Bot. xi. 5 (1931).—Low open places on the Coastal Plain from New

Jersey to northern South Carolina and inland to the mountains of the Carolinas, Georgia and Alabama; westward through Tennessee, with a few stations on the southern shores of Lake Michigan and Lake Ontario; also in coastal ranges in northern California; distributed along the Mississippi southward on the lower drainage of its western tributaries, the Missouri, Arkansas, and Red Rivers; scattered in eastern Texas, Louisiana and the coastal counties of Mississippi and Alabama; also on the peninsula of Florida, the Greater Antilles, the island of Dominica and in Central America. The citation of representative specimens is omitted because this common and widely spread variety has been so well known under the misapplied name of "*R. cymosa* Ell." However, since the nomenclatural history of the plant has been so confused it seems best to designate a type, and that is cited below. VIRGINIA: dry pinelands about 4 miles northwest of Waverly, Sussex Co., July 26, 1936, *Fernald & Long*, no. 6070 (G, TYPE; P, ISOTYPE).

In 1798 Willdenow published in his revision of the Cyperaceae for the Species Plantarum a new species, *Schoenus cymosus*. The abbreviation *v. s.* (vidi siccas)[1] appended to his description indicates that at that time a dried specimen of the same existed in his herbarium.

Forty-one years later Kunth relegated *S. cymosus* Willd. to the synonymy of *Scirpus polyphyllus* Vahl. In so doing he added to his citation of Willdenow's Species Plantarum, i. page 265 the herbarium number 1247 of the Willdenow type.

Recently Kükenthal,[2] in his treatment of *Schoenus* as part of his projected monograph of the *Rhynchosporoideae*, lists *Schoenus cymosus* Willd. as equivalent to *Rhynchospora cymosa* Ell.

The original description of Willdenow does not mention either style or achene. Due to the present international situation, it is impossible to confirm or refute by an examination of these details in the type-specimen itself either the diagnosis of Kunth or the more commonly held opinion of Kükenthal. However, not only was Kunth personally in a position to study the Willdenow type, but his citation of the not otherwise published herbarium number 1247 seems to indicate that he availed himself of this opportunity. Also, as will be indicated in the following paragraph, Kunth was well aware of the confusion surrounding Elliott's application of the specific name *cymosa* to *Rhynchospora*. Kükenthal, on the

[1] Willdenow, Sp. Pl. 1: 265 (1797).
[2] Fedde, Rep. Spec. Nov. xliv. 187 (1938).

contrary, gives no indication that he has as yet either personally examined the Willdenow type or studied in detail Elliott's description of *R. cymosa.* I am, therefore, assuming *S. cymosus* Willd. to be correctly placed by Kunth in the synonymy of *Scirpus polyphyllus.*

In 1813 the name *Schoenus cymosus* appears again, this time in the list which constitutes Muhlenberg's Catalogue. Muhlenberg's description of his new species, a necessity to the valid publication of every new species, did not follow until the publication of his Descriptio Uberior Graminum, 1817. When the description appeared, however, it unquestionably applied *S. cymosus* Muhl. to the plant which now passes under the name of *R. cymosa.* Technically, since the Willdenow species and the Muhlenberg species are not identical, Muhlenberg's name becomes a later homonym of the earlier, and, as such, is illegitimate under *Schoenus* according to the International Rules.

In 1816, while the status of *S. cymosus* Muhl. was that of a *nomen nudum,* Elliott published the first pages of his Sketch of the Botany of South Carolina and Georgia. Here he described in detail a *Rhynchospora cymosa* which he supposed to be *S. cymosus* of Muhlenberg, but, in reality, Muhlenberg's species was not validly published until a year later, when it was accompanied by its description. Elliott made, therefore, not a new combination, but a new species. Consequently it is imperative to determine the identity of his specimen which is obviously the type of *Rhynchospora cymosa.*

Kunth in his Enumeratio Plantarum assigns *R. cymosa* Elliott to *R. distans* (Michx.) Vahl, basing his determination upon a specimen "a Beyrichio misso." Both Torrey and Gray had previously suspected that Elliott's description did not apply to the plant which they knew as *R. cymosa* and which they erroneously attributed to Willdenow.

To come at the bottom of this confusion, Prof. M. L. Fernald, during the spring of 1938, kindly examined the Elliott type for me, and he states that, although immature, it is undoubtedly *R. glomerata* (Michx.) Vahl. The name *R. cymosa,* then, since it has no connection with *S. cymosus* Willd., properly dates from Elliott, belongs in the synonymy of *R. glomerata,* and cannot be rightfully used to designate any other entity.

This conclusion necessitates for the plant which was the basis of Muhlenberg's *S. cymosus* and which has until the present passed as *R. cymosa,* another name. Chapman in 1860 set apart and described the smaller *R. cymosa*, var. *globularis.* Small in 1933 raised this variety to specific rank.[1] Since in my judgment no boundary exists which specifically delimits the larger from the smaller plant, I am accepting Chapman's interpretation rather than that of Small. *R. globularis*, therefore, becomes the correct specific name. Var. *typica* is the small plant originally set apart by Chapman as var. *globularis*, and to the plant formerly treated as *R. cymosa,* I am giving the name *R. globularis* var. *recognita.*

After this discussion of *R. cymosa* was put into final form, Professor Fernald received, through the kindness of Professor Diels, Director of the Botanical Museum at Berlin, a photograph of *Schoenus cymosus*, no. 1247, in the Willdenow Herbarium. The specimen[1] was clearly a young state of *Scirpus polyphyllus*, as stated in Kunth's annotation on the right-hand side of the sheet. The specimen-cover bore in the left-hand corner the no. 1247, and on the right, in Willdenow's hand, "*Schoenus cymosus* Sp. Pl. Habitat in America boreali." This was accompanied by a diagnosis of *Schoenus umbellatus* copied from Walter,[2] in which the name *S. umbellatus* has been replaced by that of *Scirpus polyphyllus.*

59c. Var. **pinetorum** (Small), stat. nov. Leaves 1.5–2 mm. wide: clums obtusely trigonous, slender, erect, becoming flexuous, 2.7–6.9 dm. in height: inflorescence 1–4 weak glomerulose cymes: bracts inconspicuous: spikelets nearly globose, 2-flowered, 1-fruited, compact, 2.5–3 mm. long: scales mucronulate or obtuse: bristles 6, not exceeding ⅔ the height of the achene: achene 1.4 mm. wide, 1.3–1.4 mm. long; the pale flat surface covered with a dark nearly isodiametric reticulation: tubercle triangular, 0.4–0.5 mm. high. Plate 831, fig. 5A; Map 71.—*R. pinetorum* Britton & Small, in Small, Man. 183, 1503 (1933).—Moist areas in pinelands and savannas, the Peninsula of Florida, west along the coast to Louisiana; also in western Cuba and Jamaica. Florida: moist pine barrens near Jacksonville, Duval Co., *Curtiss*, no. 4871 (G); prairie near St. Johns River, Osceola Co., *McFarlin*, no. 4908 (CU); in a low pineland, Aripeka, Pasco Co., *O'Neill*, no. 2611 (CU, NY); Manavista, Manatee Co., *Tracy*,

[1] Now, with the complete herbarium at Berlin, presumably lost.
[2] Walter, Fl. Car. 70 (1788).

no. 6991 (G); pinelands west of Punta Gorda, DeSoto Co., *Small, Mosier & DeWinkler*, no. 10912 (NY, TYPE of *R. pinetorum* Britton & Small); in moist sandy ditch along roadside, Rialto, Lee Co., *Moldenke*, no. 1011 (D, NY); glade, Cutter & Black Pt., Dade Co., *Small & Carter*, no. 885 (P); swampy thicket, Washington Co., May, *Curtiss*, no. 3149 (NY). LOUISIANA: low prairies, Jennings, Jefferson Davis Parish, *Palmer*, no. 7624 (Mo, P, US). CUBA: Colpothrinax savanna between Pinar del Rio and Caloma, Pinar del Rio, *Britton, Britton & Cowell*, no. 10084 (NY). JAMAICA: along rivulets at Moneague, 1850, *Alexander* (G).

R. pinetorum Small is superficially identical with the weaker state of *R. globularis,* var. *recognita* found in the western States and the Greater Antilles. It has the same attenuated appearance, the same weak cymes, turgid spikelets, inconspicuous bracts and nearly orbicular short scales. Even its achene is similar in shape, size and tubercle. Its only claim to specific rank depends upon the surface sculpturing of the achene. This consists of a brown nearly isodiametric reticulation over a flat, usually pale background. *R. globularis* and the var. *recognita* have, by contrast, an elongate reticulation with the shorter sides of the alveoli accentuated so as to form transverse ridges on the surface of the achene. A study of the whole *globularis*-complex in Florida and Cuba, however, reveals that in this region transitional stages between isodiametric and elongate pitting with a ridged surface occur. Such are the achenes from the collection of Tracy, no. 7001, from Florida, and of Curtiss, December, 1903, from the Isle of Pines. It seems best, therefore, to reduce Small's entity to the status of a variety.

(*To be continued*)

CONTINENTAL DRIFT AND PLANT DISTRIBUTION.—Under this title Dr. Douglas Houghton Campbell[1] has privately issued a pamphlet which all students of geographic botany should have for their shelves. Whether it is wholly convincing will depend on the individual reader, for the subject is a vast, contradictory and somewhat illusive one, too often discussed by those who wishfully think their facts without too much embarrassing checking of the data. This tendency of the present author was noted by me in Ecology, vii. 510–516 (1926). At that time I wrote: "As to cranberries and Lapland rhododendron, shrubs very particularly selected by Campbell as typical of 'this northernmost zone of vegetation [the Arctic],' it is not very reassuring to one's confidence in his judgment to find that the cranberry, *Vaccinium*

[1] DOUGLAS HOUGHTON CAMPBELL. Continental Drift and Plant Distribution. Privately printed. pp. 43. 1943.

Oxycoccus, does not extend north in America even to the southern edge of the Arctic Archipelago and that in Greenland it does not extend north to the Arctic Circle; and that on the Arctic Archipelago *Rhododendron lapponicum* is known only in eastern Baffin Land and there extends only three or four degrees north of the Arctic Circle." At that time I tried to help by presenting a considerable list of *real* Arctic plants; but these have been ignored and in the new publication we again read: "Most of arctic America and Eurasia . . . have many lakes, swamps, and tundras . . . among which low prostrate shrubs, like cranberries, rhododendron . . . may grow." They may but usually they don't! And as for the imagined "arctic America" with "many lakes, swamps", etc., I quoted Steffanson and Simmons on the extreme ARIDITY of the Arctic and noted the essential lack on the Arctic Archipelago and in arctic Asia of hydrophytes and paludal groups (*Epilobium*, etc.). All that fell undigested into Campbell's waste pile.

Chatting lightly, and with illustrations drawn only from writings nearly a century old, the author tackles the eastern Asiatic-eastern American relationship, without any apparent realization that further and much more complete studies have changed some of the specific and even generic identifications. Thus, the nine species selected as "identical" in "Japan and the Eastern United States" include "*Anemone pennsylvanica*, *Rhus toxicodendron*, *Vitis labrusca*, *Spiraea betuliflora*, . . . *Aralia quinquefolia* (Ginseng)". Now to facts: *Anemone canadensis* L. (*A. pensylvanica*) is strictly North American, the Asiatic plant, *A. dichotoma*, being a separate species—See Gray, Syn. Fl. i[1]. 12 (1895)). True *Rhus Toxicodendron* is restricted to the coastal plain of the southeastern United States—See Fernald, RHODORA, xliii. 597, t. 685 (1941), the Japanese shrub being a relative of our transcontinental *R. radicans*. As to *Spiraea betulifolia* (*betuliflora* of Campbell being an evident *lapsus calami*), no one now considers our Alleghenian shrubs, *S. corymbosa* and *S. virginiana*, as conspecific with it. As to the Japanese vine which a century ago was thought to be the eastern North American *Vitis Labrusca*, the relationship is only superficial. The eastern North American *V. Labrusca* has continuous tendrils (a tendril or inflorescence opposite each leaf); the Japanese species once confused with it has the tendrils intermittent. It is *V. Coignetiae* Pulliat ex Planchon (1883), and its tiny grapes (less than 1 cm. in diameter) would look pretty poor to those who know true *V. Labrusca* with its berries 1.5–2.5 cm. broad. And when we come to "*Aralia quinquefolia* (Ginseng)" it is lucky that the colloquial name is given. The Ginsengs belong to so distinct a genus, *Panax* L., that no one since a very archaic period in taxonomy has merged them with *Aralia*. Furthermore, to get right down to the root of the matter, *Panax quinquefolium* of eastern North American forests has a simple or forking parsnip-like vertical root, the Japanese plant, *P. repens*, having a long and creeping horizontal rhizome. The relationship is only a generic one.

Passing to the Southern Hemisphere we get to a vast area unfamiliar to the reviewer, but we note (p. 16) such flat assertions as "The presence in Chile of such a striking New Zealand species as *Sophora tetraptera*, as well as three species of *Fuchsia*, a genus found elsewhere only in South America, makes it pretty certain that there must have been some much more intimate connections than now exist between South America and New Zealand." Obviously; what about Antarctica, which seems not to have registered? But why omit the two score of North American species of *Fuchsia?* Aren't they also a part of the genus?

And why in the very next paragraph include *Dichondra repens* as one of the species "common to Chile and New Zealand"? It is also common elsewhere. As early as 1845 Choisy, in DC. Prodr. ix. 451, included in its range Mauritius, the Cape of Good Hope and the East Indies, and correctly treated *D. carolinensis* Michx. as a variety of it. In one or more of its variations *D. repens* comes up through Mexico to California and Texas; thence it follows the coastal

plain way around to Virginia. "Chile and New Zealand" have no monopoly of it.

Altogether one cannot escape the conviction that the author of "Continental Drift and Plant Distribution" has simply plucked here and there, especially from early and outgrown sources, without any clear understanding of identities and actual geographic ranges. Any deductions drawn from such haphazard and wholly misunderstood data must be very doubtful. Unless an author takes pains to get his fundamental facts accurate he can expect to be followed only by those who do not know the difference. Some years ago an enthusiastic advocate of continental drift[1], who out-wegenered Wegener, found that the school-child's game of cutting out from maps and shoving together the continents left him puzzled to fit the large and irregular island of Newfoundland into the picture. The problem was solved (Baker, maps after p. 28) by obliterating the Bay of Biscay, swinging the Iberian Peninsula northward opposite Greenland and shoving Newfoundland into the broadened outlet of the Mediterranean. In so doing the imaginative reconstructor ignored the fact that much of the rim of the Gulf of St. Lawrence (southwestern Newfoundland, Cape Breton and northern Nova Scotia, the Magdalen Islands, Prince Edward Island and the Gaspé Peninsula) is characterized by homogeneous beds of gypsiferous Carboniferous deposits, and that the Gulf is supposed to have been formed by the breaking down of such relatively soluble areas. Newfoundland started where it still exists; but many of my published maps of transatlantic identities were used as proof of the trip across the Atlantic, for Newfoundland shares many Atlantic European species. There you are! I remember writing a friend at that time that some important points had been overlooked: an island on the eastern coast of Newfoundland is Baccalieu (Portuguese *bacalháo*, the codfish), two small ports on the Avalon Peninsula are Biscay Bay and Portugal Cove, and everyone entering Newfoundland from Cape Breton must pass the customs at Port aux Basques. The antiquity in their present positions of Iberia, Newfoundland and other marginal lands, with characteristic lithological structure, continuous geological histories and well demonstrated endemism of fauna and flora, are only a few of the many embarrassing matters which ardent enthusiasts ignore in their espousal of continental drift.—M. L. F.

THE ALBINO OF EPILOBIUM LATIFOLIUM.—The handsome circumpolar *Epilobium latifolium* L., or RIVER-BEAUTY, ordinarily has roseate or purplish petals, but occasionally colonies with whitish petals and pale sepals, an obvious albino, are found. Although this albino is passing as *E. latifolium*, forma *albiflorum*, I am unable to find that that patently descriptive name has the status of more than a mere *nomen;* no proper and required diagnosis of it seems to have been published. The name, merely as a name, was published by Nathorst in Öfvers. Kgl. Sv. Vidensk.-Akad. Förh. 46 (1884) in an enumeration of plants of northwest Greenland:

Epilobium latifolium L. f. *albiflora.*

That was all, except a note of the station. This name, with various inaccuracies interpolated, has been generally used for the

[1] HOWARD A. BAKER, The Atlantic Rift and its Meaning (1932).

albino, but, as stated, it seems never to have been properly defined. Thus Dr. M. P. Porsild and his son, A. E. Porsild, wrote, under *Chamaenerium* (not *Epilobium*) *latifolium* (L.) Spach, "the var. **albiflorum** Nath. is hereditary constant"—Porsild and Porsild, Meddel. om Grønl. lviii. 110 (1926)—but, although erroneously ascribing to Nathorst (who had the name of a mere forma under *Epilobium*) the publication of a variety under *Chamaenerium*, the Porsilds gave no diagnosis. Neither did Mr. A. E. Porsild, when in Rhodora, xli. 264 (1939) he published the paragraph

"Epilobium latifolium L. var. **albiflorum** (Nath.), n. comb. *Chamaenerium latifolium* (L.) Sweet [error for Spach] var. *albiflora* Nath. . . . *Epilobium latifolium* L. ssp. *leucanthum* Ulke in Can. Field-Nat. **49:** 108 (1935)."

It might be urged that, when Polunin in his Botany of the Canadian Eastern Arctic, i. 299 (1940) preceded his record of *E. latifolium*, f.. *albiflorum* Nathorst by a statement that "This is the white or pinkish flowered plant", he was giving a description. It was a description, but not the *Latin diagnosis* which before 1940 had become requisite for legitimate publication of a name.

So far as I can find the only proper diagnosis of the albino is the 24-line glorification of it, cited in the paragraph quoted from Rhodora, "A Tito Ulke descriptum". Accordingly, with no more to-do about a very trivial but striking color-form, it seems necessary to write

Epilobium latifolium L., forma **leucanthum** (Ulke), stat. nov. Ssp. *leucanthum* Ulke in Can. Field.-Nat. xlix. 108 (1935).—M. L. Fernald.

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No. IV. The Myrtaceous Genus Syzygium Gaertner in Borneo, by E. D. Merrill and L. M. Perry. 68 pp. 1939. $1.50.

No. V. The Old World Species of the Celastraceous Genus Microtropis Wallich, by E. D. Merrill and F. L. Freeman. 40 pp. 1940. $1.00.

Gray Herbarium of Harvard University, Cambridge 38, Mass.

Rhodora

JOURNAL OF

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INCREASE OF SUBSCRIPTION-PRICE OF RHODORA

RHODORA, starting in 1899 with liberal support from several generous members of the New England Botanical Club, was announced as a "monthly journal of botany, devoted primarily to the flora of New England", to be "of about sixteen pages each issue" (192 pp. per vol.) and issued at one dollar ($1.00) a volume. Actually the journal never lived down to its 192 pages a year. The first volume had 246 pages and 11 plates and the minimum was reached in vol. 22 (1920), with 207 pages and 2 plates. Through the first 34 volumes (through 1932) the size of the journal was maintained at a fairly regular figure, ranging from 207 to 318 (av. 229) pages, with 2 to 19 (av. 7) plates. Nevertheless, with the death of original underwriters of the deficits, it became necessary twice to increase the subscription-price, with vol. 15 (1913) to $1.50 and again, with much trepidation, with vol. 22 (1920) to $2.00, although the size of the journal remained approximately the same as in the first fourteen volumes.

Beginning with vol. 35 (1933) RHODORA more than doubled its paging, vols. 35–45 (1933–1943) ranging from 425 to 615 (av. 523) pages, increased its plates sevenfold, these ranging from 35 to 73 (av. 51) per volume, and, through pressure from authors, largely extended its scope. Nevertheless, because of generous aid from living supporters of the journal and bequests from former members of the New England Botanical Club, the subscription-price was still maintained at $2.00, far below actual cost. Now, however, too late to apply to vol. 46 (1944), the cost of printing has doubled, the cost of engraving increased and the journal is faced with two possibilities: either to reduce its size to that of

the early volumes, with few illustrations, or to make the price somewhat nearer the actual cost above the funds of the sponsor, the New England Botanical Club, and the guarantees from institutions most using the journal. After careful study of the problem, the second alternative has been chosen. It is, therefore, necessary to announce that

Beginning with Vol. 47 (1945) the advance subscription-price of Rhodora will be four dollars ($4.00) a year.—Eds.

Shrubs of Michigan.—The Cranbrook Institute of Science has published a very attractive and neatly illustrated handbook on Michigan Shrubs, prepared by Cecil Billington.[1] The book is bound to be interesting and helpful to beginners, for the text is clear and the drawings accurate. After the user has passed the initial stage and begins to be a scientist he will regret that it was decided to take no cognizance of progress (therefore change) in our knowledge of the flora of eastern North America since 1908. In the 36 years following that date the International Rules of Botanical Nomenclature have been completely revised, the *homonym* rule now in force necessitating many upsets of once familiar names. Furthermore, this period has seen the most searching and critical study of our flora. The user of the new book will consequently regret that these revisions and corrections of errors have not been taken into account. In fact, the author shows some dissatisfaction and registers a healthy spirit of inquiry on p. 221, when he says: "The nomenclature of the Snowberry is sadly mixed and should be studied and stabilized." Had he checked on Rhodora, xvi. 117–119 (1914) he would have found the record of such study and stabilization with the resultant name *Symphoricarpos albus* (L.) Blake. In fact, the pages of the present journal demonstrate in monographic studies a vast number of necessary changes. In these pages, too, are recorded more than 25 shrubs of Michigan which do not appear in the Cranbrook volume. Their omission is of course covered by the statement in the Introduction, that "This bulletin is not intended as a catalog of every species of shrub which has been described from Michigan." It is hoped, however, that a future edition of an attractive and useful book will recognize the importance of being more up-to-date, that the positive errors of the past will not be further perpetuated and that the admitted "Rare or Infrequent Species", which now include some which are found only on distant Isle Royale, will be liberalized to include from that Island the beautiful *Salix pellita* (see Rhodora, xxvi. 143) and such shrubs of the mainland as *Amelanchier florida, laevis, huronensis* (type from Michigan), *Rosa michiganensis*, the unique, black-fruited, western North American *Crataegus Douglassii* (wholly distinct from the complex red-fruited series) and the even more isolated and rather startling *Ceaenothus sanguineus* (see Rhodora, xvii. 229 and 230, and xxvii. 209 and 210, map 6).

The author and the Cranbrook Institute have made a good beginning. It is surely to be hoped that they will go on from this and recognize the importance of making their book a model by including all the species of the state, by most carefully checking their identities and by bringing the nomenclature to date.—M. L. F.

[1] Cecil Billington, *Shrubs of Michigan.* Cranbrook Institute of Science, Bull. no. 20. 250 pp., colored frontispiece, 161 line-drawings, 161 maps of local distribution, and illustrated glossary. Cranbrook Institute, Bloomfield Hills, Michigan, 1943. $2.50.

RHYNCHOSPORA, SECTION EURHYNCHOSPORA, IN CANADA, THE UNITED STATES AND THE WEST INDIES

Shirley Gale

(*Continued from page 249*)

Series 11. **Caducae,** ser. nov. Cymis decompositis saepissime valde fasciculatis patentibus corymbiformibus: spiculis 1–10 (semper fere 4–5)-carpis: squamis laxe imbricatis: setis 1–6 antrorse serrulatis saepissime validis (*R. perplexa* et *R. microcarpa* exceptis): achaenio elliptico-obovato vel late obovato vel suborbiculari saepissime rugoso cancellato vel striato, obscure marginato.

Growing in damp depressions, swamps, pond-margins and shallow water of the pine barrens, savannas and open woodland of the Coastal Plain; infrequent inland; also in the West Indies. Caespitose: leaves 1 (rarely)–7.5 mm. wide: culms of well developed specimens approximately 1 m. high, usually erect, becoming flexuous toward the summit, less often weakly ascending: cymes decompound, those of most species corymbiform, densely fasciculate, less often weakly spreading and with few spikelets or forming a globose net in *R. miliacea:* spikelets containing 1–mostly 4–5 (less often 6–10) achenes: scales loosely imbricate: bristles usually well developed (1–3 and rudimentary in *R. perplexa*), antrorsely serrulate: achenes elliptic-obovate to broadly obovate or suborbicular in outline, usually ridged, always cancellate or striate, obscurely marginate: tubercle basally deltoid.—*Rhynchospora* V. *Glomeratae* Small, Man. 175 (1933), in part. *Rhynchospora,* Series B. *Diplostyleae,* Sect. 5. *Glaucae* Clarke in Urban, Symb. Ant. ii. 106 (1900), in part.

Key to Species in Series Caducae

a. Bristles equalling or exceeding the achene....*b.*

b. Achene slenderly ellipsoid-obovoid, 2–2.2 mm. in length 60. *R. inexpansa.*

b. Achene slenderly to broadly obovoid or subglobose, less than 1.8 mm. in length....*c.*

c. Branchlets of the 6–9 cymes stiffly divaricate or reflexed, giving the appearance of a loose web; achene pale yellow-brown.................................61. *R. miliacea.*

c. Branchlets of the 2–5 cymes ascending to spreading, if divaricate never stiffly so; achene castaneous....*d.*

d. Achenes broadly obovate to suborbicular in outline, umbonate or swollen above, compressed below, 1.2 mm. wide or wider, 1.4 mm. long or longer....*e.*

e. Achenes striate, castaneous, 1.4–1.6 mm. wide, 1.4–1.7 mm. long, with a definite nearly terete stipe which is 0.3–0.4 mm. in length; stamens conspicuously marcescent...........................62. *R. odorata.*

e. Achenes plainly cancellate, 1.2–1.6 mm. wide, 1.4–1.6 mm. long, with a short thick inconspicuous stipe; stamens not conspicuously marcescent....63. *R. caduca.*

d. Achenes slenderly obovate or, if obovate to suborbicular in outline, small, gradually biconvex and not conspicuously swollen above, 0.8–1.2 mm. wide, 1–1.4 mm. long....*f.*

f. Cymes loose, spreading, the lax filiform branchlets widely divergent; spikelets few....*g.*

g. Bristles well exceeding the tubercle; tubercle deltoid-attenuate with setose margins........64. *R. mixta.*

g. Bristles equalling the achene; tubercle deltoid, somewhat decurrent, the margins bare...65. *R. decurrens.*

f. Cymes congested, corymbiform, the filiform branchlets ascending; spikelets numerous....*h.*

h. Achenes flat, the short transverse walls of the narrowly oblong alveoli pulled up into sharp ridges: bristles irregularly spreading....66. *R. schoenoides.*

h. Achenes moderately biconvex, the alveoli subisodiametric to broadly oblong, rugulose to only slightly ridged; bristles usually stiffly erect and closely connivent around the achene....67. *R. microcarpa.*

a. Bristles shorter than the achene or failing....*i.*

i. Achene strongly flattened, prominently ridged, striate....*j.*

j. Bristles 6, not exceeding ⅔ the achene; transverse ridges of the achene approximately 12, closely spaced; tubercle decurrent; spikelets 4 mm. long............68. *R. Torreyana.*

j. Bristles none or 1–3 rudiments; transverse ridges of the achene less than 8, widely separated.............69. *R. perplexa.*

i. Achene biconvex, slightly if at all ridged, the alveoli subisodiametric to broadly oblong..................67. *R. microcarpa.*

60. R. inexpansa (Michx.) Vahl. Caespitose, often forming stools of several–15 culms: leaves flat, 2–3.5 mm. wide; margins finely serrulate; tips triquetrous: culms obtusely triangular, becoming slender, flexuous, 0.3–1.2 m. high: inflorescence 3–6 strictly elongated decompound fasciculate cymes, 0.6–1 dm. in length, the filiform arching branches approximate; lateral cymes on exserted peduncles: spikelets fusiform, sessile or pedicellate, strongly ascending, 2–5-flowered, 1–4-fruited, 4.5–6 mm. long: scales castaneous, acute or aristulate, caducous: bristles 6, upwardly hispidulous, capillary, erect, once again as high as the tubercle: achene slenderly ellipsoid-obovoid, narrowing toward the base, extremely flattened, transversely ridged, castaneous, 0.8–1 mm. wide, 2–2.2 mm. long: tubercle deltoid, compressed, 0.9–1.2 mm. long, pale, with thickly setose margins. Plate 833, figs. 1A and 1B; Map 75.—Enum. ii. 232 (1806); Elliott, Sk. Bot. S. Car. and Ga. i. 61 (1816); Gray, Ann. Lyc. N. Y. iii. 200, pl. 6, fig. 6 (1835) and Man. ed. 2, 505 (1856); Chapman, Fl. So. U. S. 525 (1860); Britton & Brown, Ill. Fl. i. 280, fig. 660 (1896); Britton, Man. 186 (1901); Small, Fl. 198 (1903) and Man. 186 (1933); Robinson & Fernald in Gray, Man. ed. 7: 200, fig. 318 (1908). *Schoenus inexpansus* Michaux, Fl. Bor.-Am. i. 35 (1803);

Muhlenberg, Descrip. Gram. 9 (1817). *Phaeocephalum inexpansum* House, Am. Midland Nat. vi. 202 (1920).—Common in low or exsiccated ground in open areas of pinelands on the Coastal Plain from southeastern Virginia to Georgia and west to eastern Texas; inland localities in northern Alabama, northwestern Arkansas and along the Red River. Citation of specimens of this unique and well known species is not considered necessary in this paper.

61. R. MILIACEA (Lam.) Gray. Stoloniferous: leaves narrowly linear, 6–7.5 mm. wide, erect, flat, carinate; the keel and margins scabrous to smooth; tip triquetrous: culms 3-angled, leafy, slightly arching or more commonly stiffly erect, 0.9–1.4 m. high: cymes 6–9, decompound, the long wiry capillary branchlets stiffly divaricate or often reflexed, giving to the cyme a loose, web-like appearance, 0.7–1 dm. wide; lateral cymes on subexserted peduncles: spikelets ovoid, turgid, 3–4 mm. long, distant on elongated slender pedicels, 4–12-flowered, 3–10-fruited: scales aristulate, loosely imbricate, promptly caducous exposing a "spikelet" of naked achenes: bristles 6, fragile, spreading, upwardly serrulate, exceeding the tubercle: achene broadly obovoid, biconvex, transversely ridged to rugulose, longitudinally striate, pale, 0.9–1.1 mm. wide, 1–1.3 mm. long: tubercle depressed-conic, often apiculate, 0.2–0.4 mm. long. PLATE 833, FIGS. 2A and 2B; MAP 74.—Ann. Lyc. N. Y. iii. 198, pl. 6, fig. 4 (1835); Chapman, Fl. So. U. S. 526 (1860); Grisebach, Cat. Pl. Cub. 243 (1866); C. Wright in Sauvalle, Anal. Acad. Ci. Habana viii. 84 (1871) and Fl. Cub. 179 (1873); Small, Fl. 198 (1903) and Man. 186 (1933); Britton, Mem. Soc. Cubana Hist. Nat. ii. 199 (1916); Kükenthal, Fedde Rep. Spec. Nov. xxiii. 211 (1926). *Schoenus miliaceus* Lamarck, Ill. Gen. i. 137 (1791). *R. sparsa* Vahl, Enum. ii. 230 (1806); Elliott, Sk. Bot. S. Car. and Ga. i. 62, pl. 2, fig. 1 (as *Schoenus*) (1816); Torrey, Fl. N. and Mid. St. no. 1: 56 (1823); Clarke in Urban, Symb. Ant. ii. 131 (1900). *Schoenus sparsus* Michaux, Fl. Bor.-Am. i. 35 (1803); Muhlenberg, Descrip. Gram. 7 (1817). *Phaeocephalum miliaceum* (mispelled *milaceum*) House, Am. Midland Nat. vi. 202 (1920).—Often standing in water of swamps of the Coastal Plain from southeastern Virginia and North Carolina (rarely) southward to the Florida Peninsula, and west to Louisiana; also in the western provinces of Cuba and in eastern Hispaniola. VIRGINIA: *Read* (P, as "*Schoenus sparsus*"), presumably from Norfolk Co. NORTH CAROLINA: swamp at Newport, Carteret Co., *Godfrey*, no. 4412 (D, G); peaty grass-sedge savanna at Carolina Beach, New Hanover Co., *Godfrey*, no. 4684 (G, NC); edge of swamp, Southport, Brunswick Co., Jan. 28, 1922, *Bartram* (G, P). SOUTH CAROLINA: swamp, 1½ miles west of Andrews, Georgetown, Georgetown Co., *Godfrey & Tryon*, no. 541 (G, NY);

wet places along Santee Canal, Berkeley Co., *Ravenel* (G). Carolina: in umbrosis Carolinae, *Michaux Herb.* (G, type-photo of *Schoenus sparsus*); east Carolina, *D. Fraser in Herb. Leonard* (G, type-photo of *Schoenus miliaceus*). Georgia: shaded pool of clear cold water, Leslie, Sumter Co., *Harper*, no. 1017 (G, NY, US); semi-calcareous swamp of small creek about ½ mile east of Cedar Springs, Early Co., *Harper*, no. 3635 (G, P, US). Florida: swamps near Jacksonville, Duval Co., *Curtiss*, no. 3163 (CU, D, G, NY, P, US); Devils Mill Hopper, lime-sink near Gainesville, Alachua Co., *O'Neill*, no. 586 (US); rooting under water, Silver Springs, Marion Co., *O'Neill*, no. 2606 (CU); damp places, Ormond, Volusia Co., *Fuller* (G); Eustis, Lake Co., *Nash*, no. 1845 (G, NY, P, US); in mud of bog in open woods near Oviedo, Seminole Co., *Correll*, no. 6361 (CU, D, G); in moist woodland, south of Aripeka, Hernando Co., *Moldenke*, no. 1065 (D, NY); rooting under water in a spring, pasture hammock, Lake Jovita, Pasco Co., *O'Neill*, no. 1060 (CU, US); swamp, between Shingle and Bonnet Creek, Kissimmee, Osceola Co., Mar. 13, 1938, *Singletary* (D); in a swamp, Polk City, Polk Co., *O'Neill*, no. 7682 (CU); sand-barren swamps, Tampa, Hillsborough Co., Apr. 11, 1923, *Churchill* (G); the Okaloacoochee Slough, Big Cypress, Lee Co., *Small*, no. 8311 (NY); in everglades near Camp Long View, Dade Co., *Small & Wilson*, no. 1644 (NY); bogs and deep miry places, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 231a (G, NY, US). Alabama: deep shaded springy places, eastern shore, Mobile Bay, Point Clear, Baldwin Co., June 10, 1879, *Mohr* (US). Louisiana: abundant in cypress-tupelo swamp, Rone Ferry on Tickjaw River, Livingston Parish, *Brown*, no. 6573 (La); New Orleans, 1832, *Drummond* (G); sandy ditch near swamp in northern vicinity of Houma, Terrebonne Parish, May 1, 1913, *Wurzlow* (US); pine swamps, Calcasieu Parish, April, 1870, *Featherman Collection* (La); marshes, Alexandria, Rapides Parish, *Herb. Thurber* (G). Cuba: Santo Tomas, Cienaga de Zapata, Santa Clara, *Acuña*, no. 4305 (NY); in coastal swamps, in a wood of Peralta Estate, Batabano, Havana, *León*, no. 14195 (NY); *Wright*, no. 3788 (G, US). Hispaniola: Macary in Etang Promosse, Marigot, Massif de la Selle, Haiti, *Ekman*, no. 5978 (NY, US).

62. R. odorata C. Wright ex Griseb. With short stolons: leaves 3.5–6 mm. wide, arching, carinate, smooth, becoming triquetrous at the tip, with finely serrulate angles: culms stocky, becoming flexuous at the summit, 3-angled, smooth, 0.7–1.8 m. high: cymes 3–4, decompound, densely fasciculate, 3–4 cm. wide, 3–7.5 cm. long; branchlets mainly arched-ascending: spikelets ovoid, 3–11-flowered, 1–7-fruited, 6–9 mm. long: scales acute-aristate, loosely imbricate, ferruginous, caducous:

Range of 77, Rhynchospora mixta; 78, R. decurrens; 79, R. schoenoides; 80, R. Torreyana; 81, R. perplexa; 82. R. microcarpa.

stamens conspicuously marcescent: bristles 6, irregularly ascending to spreading, slenderly attenuate, usually well exceeding the tubercle, upwardly serrulate, 3.2–4.2 mm. long: achene orbicular in outline, strongly biconvex, transversely ridged and strongly marked by longitudinal striae, castaneous, 1.4–1.6 mm. wide, 1.4–1.7 mm. long, with a conspicuous persistent stipe, 0.3–0.4 mm. long: tubercle deltoid-compressed, somewhat depressed, usually dark with setose margins. Plate 833, figs. 3A and 3B; Map 73.—Cat. Pl. Cub. 242 (1866); C. Wright in Sauvalle, Anal. Acad. Ci. Habana, viii. 83 (1871) and Fl. Cub. 179 (1873). *R. stipitata* Chapman, Fl. So. U. S. ed. 2: 660 (1883); Hemsley, Rep. Sci. Res. Voy. Challenger, Bot. i. 76, pl. 10 (1885); Clarke in Urban, Symb. Ant. ii. 129 (1900); Small, Fl. 198 (1903) and Man. 186 (1933); Britton, Fl. Bermuda, 53, fig. 82 (1918). *R. Marisculus* sensu Clarke in Urban, Symb. Ant. ii. 132 (1900), in part. *R. Marisculus* sensu Britton, Mem. Soc. Cubana Hist. Nat. ii. 200 (1916), in part, excl. syn. *R. jubata* Liebm. *R. Marisculus* sensu Britton & Millspaugh, Bahama Fl. 56 (1920); non Lindl. et Nees in Mart. *R. caduca* sensu Kükenthal, Fedde Rep. Spec. Nov. xxiii. 210 (1926) and xxxii. 77 (1933); non Ell. *Phaeocephalum stipitatum* House, Am. Midland Nat. vi. 202 (1920).—Swamps of the Coastal Plain from North Carolina (one collection from Carteret Co.) to the Florida Peninsula, Bermuda, New Providence of the Bahamas and the Greater Antilles. North Carolina: sand banks near Beaufort, Carteret Co., *Lewis*, no. 76 (NY). Georgia: *Baldwin* (P). Florida: low rich places near Jacksonville, Duval Co., *Curtiss*, no. 3141 (P); swamp near Mosquito Inlet, Volusia Co., *Curtiss*, no. 3174

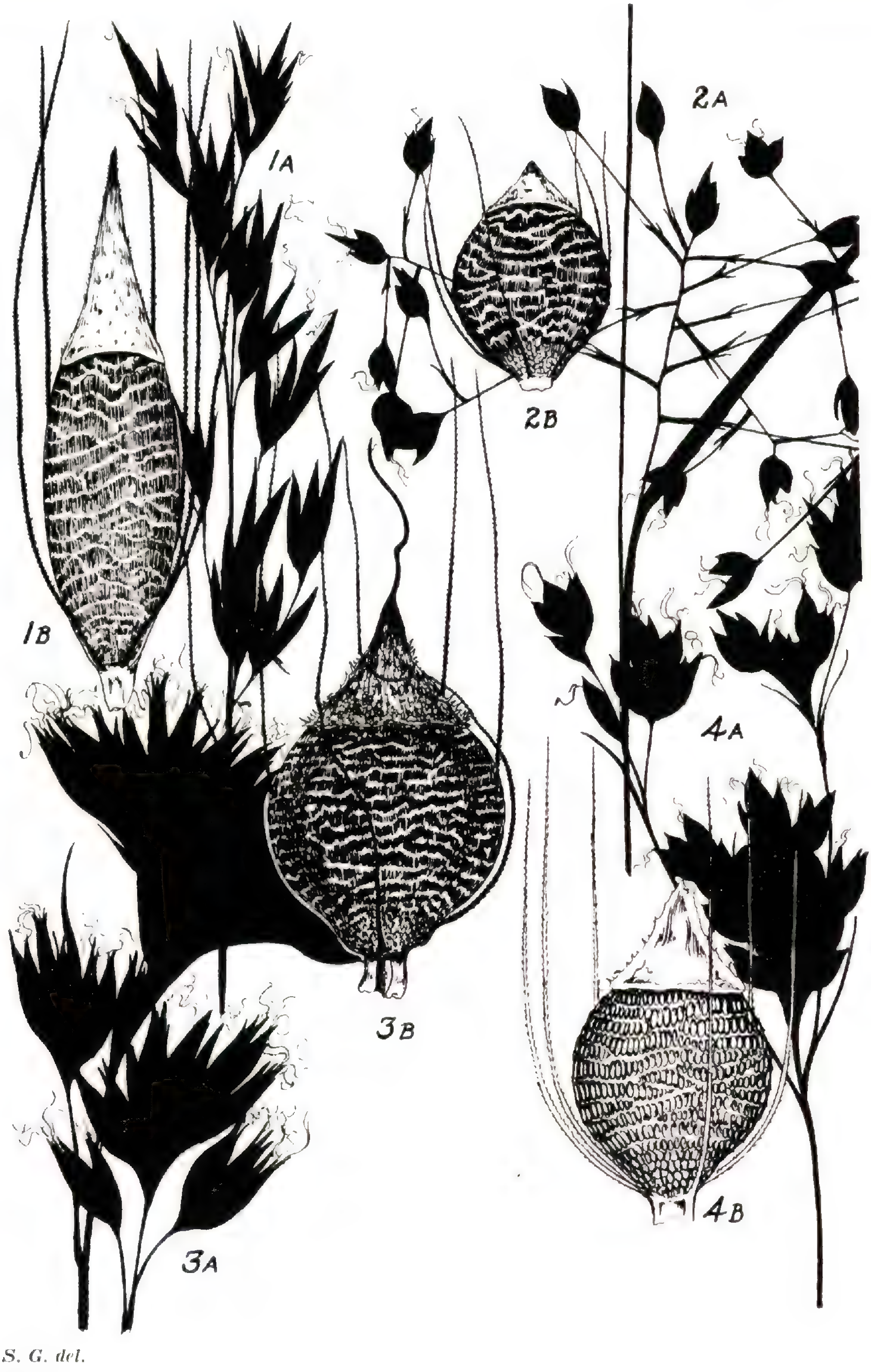
(CU, G, NY, US); swamp, 7 miles southeast of Ft. Christmas, east of Orlando, Orange Co., June 25, 1927, *O'Neill* (CU); wet thicket, Eau Gallie, Indian River, Brevard Co., *Curtiss*, no. 5719 (G, NC, NY, US); roadside, low ground, Deer Park Section, Osceola Co., Apr. 28, 1938, *Singletary* (D); flatwood ponds, Myers, Lee Co., *Hitchcock*, no. 419 (G, NY, US); Miami, Dade Co., *Tracy*, no. 8987 (C, NY, US); Arch Creek Prairie, Dade Co., *Small, Mosier & Small*, no. 6776 (NY); along canal, 2 miles west of Pine Crest in the Everglades, Monroe Co., *O'Neill*, no. 7647 (D, NY, P). Bermuda: Devonshire Marsh, *Brown & Britton*, no. 94 (G, NY, US). Bahamas: near Nassau, New Providence, *Curtiss*, no. 170 (G). Cuba: La Punta de la Jarela, jurisdiccion Guane, Pinar del Rio, Dec. 23, 1863?[1], *Wright*, no. 3394 (G); in coastal marshes, Cienaga de Gamboa, Pinar del Rio, *Ekman*, no. 17584 (NY); *Wright*, no. 3787 (G, NY, US; cited by Wright in Sauvalle.); somewhat moist places at "Loma Vista," Nueva Gerona, Isla de Pinos, *Ekman*, no. 12374 (US); savanna, Rio de los Casas, Isle of Pines, *Britton & Wilson*, no. 15662 (NY, US); lagoons of Santa Fé, northeast of Stabo, Matanzas, *Roca & Edmond*, no. 9635 (NY); Sabana Guane, Caibarien, Santa Clara, *Fernando*, no. 480 (NY); Cienfuegos and vicinity, Santa Clara, *Cuesta*, no. 764 (NY); al norte de la Bahia de Cochinos, Santa Clara, *León & Loustalot*, no. 9506 (NY). Jamaica: marsh, 1 mile west of Black River, Cornwall, *Britton*, no. 1356 (NY); border of Great Morass, Negril and vicinity, Cornwall, *Britton & Hollick*, no. 2116 (NY). Hispaniola: coastal swamp at Carbarete, Tosua, prov. Puerto Plata, Cordillera Septentrional, Santo Domingo, *Ekman*, no. 14535 (G, NY, US). Puerto Rico: Point Congrejos, *Stevenson*, no. 1706 (NY, US).

63. R. caduca Ell. Spreading by means of short stolons, occasionally forming dense stools: leaves 4–7 mm. wide, flat, slightly carinate, mainly ascending; tips triquetrous, with minutely scabrous angles: culms robust, acutely 3-angled, erect, becoming flexuous at the summit, 0.7–1.2 m. high: cymes 3–5, decompound, strict, 0.5–1.2 dm. long, usually densely fasciculate and often arching, but attenuated specimens occurring with scattered spikelets on weak, spreading branchlets: spikelets ovoid, fasciculate and sessile or single and slenderly pedicellate, 3–6-flowered, 2–5-fruited, 4–4.5 mm. long: scales acute to aristulate, caducous, dark brown, loosely imbricate: bristles 6, brittle, well exceeding the tubercle, upwardly hispidulous: achene obovate to rotund in outline, strongly umbonate, 1.2–1.6 mm. wide, 1.4–1.6 mm. long; entire surface cancellate with the horizontal walls of the oblong alveoli contiguous, accentuated and forming horizontal ridges: tubercle deltoid, compressed and slightly depressed, usually pale, setose, 0.6–0.8 mm. in height. Plate

[1] See Underwood, Bull. Torr. Bot. Cl. xxxii. 297 (1905).

S. G. del.

Rhynchospora decurrens: fig. 1A, portion of inflorescence, × 2; fig. 1B, achene, × 20.
R. microcarpa: fig. 2A, portion of inflorescence, × 2; fig. 2B, achene, × 20.
R. perplexa: fig. 3A, portion of inflorescence, × 2; fig. 3B, achene, × 20.
R. mixta: fig. 4A, portion of inflorescence, × 2; fig. 4B, achene, × 20.



S. G. del.

Rhynchospora inexpansa: fig. 1A, portion of inflorescence, × 2; fig. 1B, achene, × 20.
R. miliacea: fig. 2A, portion of inflorescence, × 2; fig. 2B, achene, × 20.
R. odorata: fig. 3A, portion of inflorescence, × 2; fig. 3B, achene, × 20.
R. caduca: fig. 4A, portion of inflorescence, × 2; fig. 4B, achene, × 20.

833, FIGS. 4A and 4B; MAP 76.—Sk. Bot. S. Car. and Ga. i. 62 (1816); Gray, Ann. Lyc. N. Y. iii. 199, pl. 6, fig. 5 (1835); Chapman, Fl. So. U. S. 526 (1860); Small, Fl. 197 (1903) and Man. 185 (1933). *R. patula* Gray, Ann. Lyc. N. Y. iii. 201, pl. 6, fig. 8 (1835), for the most part. *Phaeocephalum caducum* House, Am. Midland Nat. vi. 201 (1920).—Frequent in meadows and marshes on the Coastal Plain from southeastern Virginia south to Florida and west to eastern Texas; known inland only from a few localities in the mountains of Georgia and Alabama and in northwestern Arkansas. VIRGINIA: border of damp sandy pine woods east of Gloucester, Gloucester Co., *Fernald & Long*, no. 8613 (G, P); border of pond-hole in woods east of Hornsby (Tampico), York Co., *Fernald & Long*, no. 8611 (G, P); inner border of brackish to fresh marsh along Back Bay at eastern margin of Long Island, Princess Anne Co., *Fernald & Long*, no. 10555 (G); boggy swale by Northwest River, near Northwest, Norfolk Co., *Fernald, Griscom & Long*, no. 4578 (G); swaley tidal shore of Nottoway River, Knight Seine Beach (Battle Beach), Southampton Co., *Fernald & Long*, no. 10148 (G, P); exsiccated argillaceous pineland, about 2 miles east of Stony Creek, Sussex Co., *Fernald & Long*, no. 8999 (G, P). NORTH CAROLINA: in boggy soil near Elizabeth City, Pasquotank Co., *Correll*, no. 2110 (D); marsh at Sligo, Currituck Co., *Godfrey*, no. 5283 (G); marsh at Edenton, Chowan Co., *Godfrey*, no. 5340 (G); meadow, Oxford, Granville Co., *Godfrey*, no. 5496 (G); damp sandy open spots, 4 miles east of Plymouth, Washington Co., *Wiegand & Manning*, no. 588 (G); sandy soil bordering Brice Creek, 2 miles southwest of James City, Craven Co., *Randolph & Randolph*, no. 865 (G); near Deep River, Lee Co., *Blomquist*, no. 5622 (D); Pender Co., June 7–12, 1899, *Ashe* (NC); drainage ditch at Carolina Beach, New Hanover Co., *Godfrey*, no. 4718 (G); woodland at Lake Waccamaw, Columbus Co., *Godfrey & Shunk*, no. 4169 (G, NC); banks of Little Long Creek, Albemarle, Stanly Co., alt. 250 ft., Aug. 17, 1892, *Small* (NY). SOUTH CAROLINA: in udis juxta Charleston, *Elliott* (G, TYPE-PHOTO); Lancaster Co., *House*, no. 2554 (US); in rich soil in hammock, Isle of Palms, Charleston Co., alt. 5 ft., *Clausen & Trapido*, no. 3567 (NY). GEORGIA: wet meadow near Middle Oconee River, Clarke Co., alt. 575 ft., *Harper*, no. 159 (NY, US); between Alcovy River and No Business Creek, Oconee and Gwinnett Cos., July 14, 1893, *Small* (G); wet woods between Sandfly and Savannah, Chatham Co., *Harper*, no. 1829 (G); in ditches bordering swamp, 14 miles south of Hawkinsville, *Svenson*, no. 6977 (G); margin of pool, Leslie, Sumter Co., *Harper*, no. 1241 (G); Albany, Dougherty Co., *Miller*, no. 502 (US). FLORIDA: low rich places, near Jacksonville, Duval Co., *Curtiss*, no. 3141 (D, G, P); flatwoods, 4 miles west of St. Augustine, St.

Johns Co., June 7, 1940, *West & Arnold* (CU); St. Vincent Island, Franklin Co., *McAtee*, no. 1820a (US); in low pineland, Lake City, Columbus Co., *O'Neill*, no. 7674 (CU); wet hammock, vicinity of Eustis, Lake Co., *Nash*, no. 139 (G); in edge of low woods near Mabel, Sumter Co., *Curtiss*, no. 6631 (G, P); swamps, Myers, Lee Co., *Hitchcock*, no. 422 (G); moist open ground, 1 mile west of Arcadia, DeSoto Co., *Blomquist*, no. 8958 (G, D); near Tallahassee, Leon Co., *Berg* (NY); Herb. Baldw. (NY, annotated as *R. patula* by Gray). Alabama: Auburn, Lee Co., *Earle*, no. 859 (NY); pine woods, Ball Play, Etowah Co., *Mohr* (US). Mississippi: Saratoga Co., *Tracy*, no. 8464 (G). Arkansas: Benton Co., *Plank*, no. 17 (NY). Louisiana: in prairies, Coteau Duchamps, St. Martin Parish, June 23, 1893, *Langlois* (CU, G); open field, Steele Place, Baton Rouge, East Baton Rouge Parish, *Trotter & Chilton*, no. 42 (La); low prairies, Jennings, Jefferson Davis Parish, *Palmer*, no. 7625 (CA, Mo, P). Texas: Palestine, Anderson Co., Apr. 19, 1895, *Plank* (NY); Orange, Orange Co., *Letterman* (Mo); Port Arthur, Jefferson Co., July 5, 1927, *Kolthoff* (P); about 5¾ miles south of Anahuac, Chambers Co., *Cory*, no. 22404 (G); Cypress City, Harris Co., *Boll*, no. 884 (G); Caney Post Office, Brazoria Co., *Bechdolt*, no. 4 (G); banks, Hempstead, Waller Co., *Hall*, no. 711 (G, Mo); Burnet, Burnet Co., Sept. 14, 1892, *Plank* (NY); prairie near Indianola, Calhoun Co., *Ravenel*, no. 159 (NY); coastal prairie, Midfields, Matagorda Co., *Tharp*, no. 2139 (US).

64. R. mixta Britt. ex Small. Stoloniferous: leaves 3–4 mm. wide, flat, subcarinate, becoming triquetrous at the tip; margins minutely scabrous: culms triangular, slender, becoming filiform and arched toward the summit, approximately 1 m. in height: cymes 4–6, decompound, fasciculate, 2.5–5.5 cm. wide, often extremely lax and flexuous in appearance due to the attenuated pedicels which may be strongly divergent; axillary cymes on exserted peduncles: spikelets ovoid, 2 (rarely)–10-flowered, 1 (rarely)–10-fruited, 4–6 mm. in length, commonly distant: scales mucronulate or acute, loosely imbricate, characteristically caducous, castaneous: bristles 6–8, extremely slender, brittle, well exceeding the tubercle, upwardly hispidulous, 2.2–2.8 mm. long: achene slightly compressed, otherwise slenderly obovoid, 0.8–0.9 mm. wide, 1.3–1.4 mm. long; surface pale and dull but covered with a brown isodiametric reticulation, the transverse walls of which are barely if at all elevated: tubercle deltoid-attenuate, 0.4–0.9 mm. long, compressed, with a conspicuously setose margin. Plate 832, figs. 4A and 4B; Map 77.—Fl. 197, 1328 (1903) and Man. 186 (1933). *R. prolifera* Small, Fl. 198, 1328 (1903) and Man. 186 (1933). *Phaeocephalum mixtum* House, Am. Midland Nat. vi. 202 (1920). *Phaeocephalum proliferum* House, Am. Midland Nat. vi. 202 (1920).—Swampy woodlands

of Coastal Plain from North Carolina to northern Florida and west to eastern Texas. NORTH CAROLINA: Elizabeth City, Pasquotank Co., *Kearney*, no. 1993 (US); ditch, Beaufort Co., *Blomquist*, no. 5614 (D); stream-margin, Holden Beach, Brunswick Co., *Blomquist*, no. 5614 (P). SOUTH CAROLINA: wet swampy woodland, 12 miles north of Georgetown, Georgetown Co., *Godfrey & Tryon*, no. 111 (D, G, NY, P). GEORGIA: moist shaded sandy place in Ogeechee River swamp, Burke Co., *Harper*, no. 768 (G, NY, US); bank of Ocmulgee River, Hawkinsville, Pulaski Co., *Harper*, no. 1385 (G, NY, US); Marshallville, Macon Co., *Earle*, no. 2973 (NY, TYPE); rich woods in southeastern part of Sumter Co., *Harper*, no. 490 (NY, US); moist sandy places, Leslie, Sumter Co., *Harper*, no. 408 (NY, type of *R. prolifera* Small; US, isotype); swamp of Chickasawhatchee Creek at Johnson Bridge N., Elmodel, Baker Co., *Eyles*, no. 7059 (Hermann Herb.). FLORIDA: wet sandy soil near Perry, Taylor Co., *Palmer*, no. 27285 (G); low ground, Marianna, Jackson Co., May 26, 1940, *Sargent* (Sargent Herb.); river swamps, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 4471 (G, NY, US); swamps, Walton Co., 1885, *Curtiss* (NY); swampy woods along Yellow River near Milligan, Santa Rosa Co., *Curtiss*, no. 6854 (G; US, in part). ALABAMA: palmetto swamp, vicinity of Auburn, Lee Co., *Pollard & Maxon*, no. 42 (G, NY, US). MISSISSIPPI: Ocean Springs, Jackson Co., *Tracy*, no. 114 (NY). LOUISIANA: vicinity of Covington, St. Tammany Parish, *Arsène*, no. 12307 (US); mixed pine and palmetto, half way between Walker and St. Sillman, Livingston Parish, *Trotter & Chilton*, no. 129 (La); ditches, Baton Rouge, Baton Rouge Parish, May 19, 1874, *Joor* (US). TEXAS: in bed of brook in high mixed forest, 5 miles south of Nacogdoches on Lufkin Road, Nacogdoches Co., *Lundell & Lundell*, no. 9643 (CU); 1883, *Neally*, no. 28 (NY, US); East Texas, *Wright* (G).

R. mixta has a culm which, in common with so many members of this series, varies in degree of flexuosity from upright, with a curving distal internode, to weak, attenuated and nearly procumbent. Specimens of the latter extreme have open fascicles with long filiform divergent branchlets; those with the greatest stiffness, however, have flexuous but not open fascicles, the branchlets of which are often shorter, usually ascending, causing a closer approximation of the spikelets. As in the closely related *R. miliacea*, the number of achenes in a spikelet is very variable. I consider that Small, in designating those specimens which have spikelets bearing from 8–10 achenes as *R. prolifera*, set up an artificial boundary which alone delimited that species from *R. mixta* of Britton.

65. R. decurrens Chapman. Caespitose: leaves flat, 3 mm. wide, smooth, soft, with 3-angled setaceous tips: culms obtusely trigonous, smooth, slender, becoming flexuous, leafy, approximately 0.8–1.1 m. high: cymes 4–5, decompound, loose, somewhat spreading, 2–5 cm. wide, the filiform branchlets lax or drooping, bearing a few scattered or somewhat congested spikelets; lateral cymes distant, on exserted peduncles: spikelets rotundly ovoid, 3 mm. long, 3–4-flowered, 2–3-fruited, scattered or somewhat congested on capillary pedicels: scales mucronulate or muticous, chestnut-brown, caducous: bristles 6, extremely tenuous, fragile, upwardly hispidulous, equalling the achene in height: achene obovoid, slightly biconvex, bright chestnut, 0.9 mm. wide, 1.3 mm. long; the surface pitted, tending to become transversely rugulose: tubercle deltoid, compressed, somewhat decurrent, not setose. Plate 832, figs. 1A and 1B; Map 78.—Fl. So. U. S. 525 (1860); Small, Fl. 198 (1903) and Man. 185 (1933). *Phaeocephalum decurrens* House, Am. Midland Nat. vi. 201 (1920).—Swamps and marshy stream-banks, Columbus Co., North Carolina (one collection) and Florida. North Carolina: edge of swamp, 1 mile east of Old Dock, Columbus Co., *Blomquist & Correll*, no. 9444 (D). Florida: in swamp, Callahan, Nassau Co., *O'Neill*, no. 6017 (CU); south branch, St. Mary's River, summer, 1885, *Curtiss* (NY); marshy banks of streams, Dead Lakes, Calhoun Co., *Mohr*. no. 68 (US); marshy banks of lakes and rivers, Wewahitchka, Calhoun Co., *Chapman in Biltmore Herb*. no. 5964 (G, in part; NY); St. Joseph, Pasco Co., *Chapman* (NY); damp thickets, bank of Chittahachee River, Monroe Co., June 25, 1880, *Mohr* (US, in part); swamps, western Florida, July 20, 1880, *Mohr* (NY).

R. decurrens is most closely related to *R. mixta* Britt. This is at once apparent in the habit which is indistinguishable from that of *R. mixta*, for the plant has the same lax and drooping aspect with the typical flat soft leaves, and the loose cymes with their spreading or drooping filiform branchlets. The distinction between the two species depends upon achenial characters. The six bristles surrounding the customarily pale chestnut achene of *R. mixta* exceed the deltoid-attenuate tubercle which is 0.4 (rarely)–0.9 mm. high and marginally setose. The achene of *R. decurrens*, however, while similar to that of *R. mixta* in pitting and general outline, is a brilliant chestnut, surrounded by six bristles in height not equalling the tubercle, which is short (not exceeding 3 mm. long), broadly deltoid, and without a trace of marginal setae.

66. R. SCHOENOIDES (Ell.) Wood. Coarsely caespitose: leaves 4.5–5 mm. wide, flat, toward the apex becoming carinate and finely serrulate along the margins, triquetrous at the apex: culms 3-angled, becoming slender and flexuous, 0.8–1.5 m. high: cymes 2–5, decompound, densely fasciculate, irregularly corymbiform, 2–6 cm. wide; the branchlets approximate, arching, terminating in glomerulate clusters of spikelets; lateral panicles subexserted on slender peduncles: spikelets rotundly ovoid, turgid, 3–6-flowered, 2–4-fruited, 2.5–3.2 mm. long: scales mucronulate, loose, caducous, dark brown: bristles 6, exceeding the tubercle, upwardly hispidulous, characteristically divergent: achene pyriform, extremely flattened, heavily striate between the few well-spaced transverse ridges, often pale to castaneous, 0.9–1.1 mm. wide, 1.2–1.3 mm. long: tubercle deltoid, sometimes apiculate, compressed, 0.3–0.4 mm. high. PLATE 834, FIGS. 2A and 2B; MAP 79.—Class-Book of Bot. 744 (1861); Britton, Trans. N. Y. Acad. Sci. xi. 92 (1892); Small, Fl. 198 (1903) and Man. 185 (1933). *Scirpus schoenoides* Elliott, Sk. Bot. S. Car. and Ga. i. 89 (1816). *R. Elliottii* Dietrich, Sp. Pl. ed. 6: ii. 69 (1833), non Gray; Chapman, Fl. So. U. S. 525 (1860). *R. multiflora* Gray, Ann. Lyc. N. Y. iii. 200, pl. 6, fig. 7 (1835). *Phaeocephalum schoenoides* House, Am. Midland Nat. vi. 202 (1920).—Roadside ditches and low ground in pine barrens and prairies of the Coastal Plain from North Carolina south to Georgia and west to eastern Texas. NORTH CAROLINA: sandy grassy pineland 10 miles east of Washington, Beaufort Co., *Oosting*, no. 15 (D); roadside-ditch through savanna, between Newport and New Bern, Carteret Co., *Blomquist*, no. 11247 (D); low pineland at Dunn, Harnett Co., *Godfrey*, no. 6143 (D, G); in ditch, Robeson Co., July 4, 1940, *Schallert* (G); in low wet sandy soil of ditch along road between Garland and White Lake, Bladen Co., *Correll*, no. 2562 (CU, D, G); pineland at Hallsboro, Columbus Co., *Godfrey*, no. 6267 (G). SOUTH CAROLINA: peaty exsiccated area in savanna at the side of road, 12 miles north of Georgetown, Georgetown Co., *Godfrey & Tryon*, no. 10 (CU, D, G, NY, P); peaty drainage-ditch, 2 miles west of Salters, Williamsburg Co., *Godfrey & Tryon*, no. 518 (G). GEORGIA: *Dr. Baldwin* (G, TYPE-PHOTO); sand-clay ditch, by pine woods, 5 miles northwest of Ways, Bryan Co., *Wiegand & Manning*, no. 626 (G); in swamp of Big Lott's Creek, Bullock Co., *Harper*, no. 974 (G, US); low ground, Folkston, Charlton Co., *Biltmore Herb.*, no. 10734a (US); wet clay holes, 5 miles west of Tifton, Tift Co., *Svenson*, no. 7085 (G); pine barrens near Americus, Sumter Co., July 20, 1897, *Harper* (G); Georgia?, *Elliott* (NY, fragment from Elliott Herb.). ALABAMA: boggy sandy ditch, 16 miles south of Dothan, Houston Co., *Wiegand & Manning*, no. 627 (G); Leroy, Washington Co., *Bequaert*, no. 11521 (G); *Drummond*, no. 251

(G). Mississippi: Ocean Springs, Jackson Co., *Pollard*, no. 1124 (G, NY, US); Pass Christian, Harrrison Co., Dec. 18, 1919, *Bartram* (P). Louisiana: stream-bottom south of Franklinton, Washington Parish, *Brown*, no. 6446 (La); vicinity of Covington, St. Tammany Parish, *Arsène*, no. 11066 (G); same locality, *Arsène*, no. 12220 (Mo, US); plentiful in pools along road in pine flats 2 miles west of Hammond, Tangipahoa Parish, *Hester*, no. 808 (La); New Orleans, ?*Drummond in Herb. Hook.*, no. 367 (NY); common in prairie west of Crowley, Acadia Parish, *Brown*, no. 5810 (La); common in low prairies, vicinity of Lake Charles, Calcasieu Parish, *Mackenzie*, no. 44 (Mo, NC). Texas: grows in a pond 3 miles below Town Bluff, Tyler Co., *Wright* (G); 2.6 miles east of Camp Jackson, Hardin Co., *Cory*, no. 19714 (CU); near Liberty, Liberty Co., *Bequaert*, no. 11500 (G).

67. R. microcarpa Baldw. ex Gray. Caespitose or solitary: leaves 1–3 mm. wide, rarely narrower, flat; upper margins serrated; tips 3-angled: culms obtusely triangular, leafy, ascending, becoming tenuous and flexuous above, 5–8 dm. high: cymes 1–4, decompound, fasciculate, often densely so, irregularly corymbiform, 1–6 cm. wide; lateral fascicles short-pedunculate: bracts leafy: spikelets ovoid, sometimes rotundly so, 3–4-flowered, 2–3-fruited, congested, sessile, 2.5–3 mm. long: scales aristulate to acute, dark brown, more or less loose: bristles 6, varying in length from ½ the achene to equalling the tubercle, stiffly erect: achene obovoid, slightly biconvex, glistening bright brown, deeply alveolate, with the pits subisodiametric to broadly oblong, only slightly ridged, 0.8–1.2 mm. wide, 1–1.2 mm. long: tubercle short, deltoid, compressed, 0.2–0.5 mm. long. Plate 832, figs. 2A and 2B; Map 82.—Ann. Lyc. N. Y. iii. 202, pl. 6, fig. 9 (1835); Chapman, Fl. So. U. S. 525 (1860); Britton, Trans. N. Y. Acad. Sci. xi. 92 (1892); Clarke in Urban, Symb. Ant. ii. 130 (1900); Britton, Mem. Soc. Cubana Hist. Nat. ii. 199 (1916); Small, Fl. 198 (1903) and Man. 185 (1933); Britton & Millspaugh, Bahama Fl. 55 (1920); Kükenthal, Fedde Rep. Spec. Nov. xxiii. 210 (1926), in part. *R. patula* Gray, Ann. Lyc. N. Y. iii. 201, pl. 6, fig. 8 (1835), in small part. *R. Torreyana* Gray, var. *microrhyncha* Grisebach, Cat. Pl. Cub. 243 (1866). *R. gracilis* sensu C. Wright in Sauvalle, Anal. Acad. Ci. Habana, viii. 84 (1871) and Fl. Cub. 179 (1873), in part; non (Swartz) Vahl. *R. involuta* C. Wright in herb. ex Clarke in Urban, Symb. Ant. ii. 130 (1900). *R. perplexa* sensu Britton & Millspaugh, Bahama Fl. 55 (1920), not as to type, *R. perplexa* Britton ex Small. *R. Edisoniana* Small, Man. 184, 1503 (1933). *Phaeocephalum microcarpum* House, Am. Midland Nat. vi. 202 (1920). *Phaeocephalum patulum* (misspelled *palulum*) House, Am. Midland Nat. vi. 202 (1920), in small part.—Swamps and pond-margins of North Carolina (one collection), southern Georgia

and Florida westward along the coast to Louisiana; also on the Bahamas, and in the western provinces of Cuba and Puerto Rico. NORTH CAROLINA: Wilmington, *Curtis* (NY, cited by Gray in type-description). GEORGIA: in shallow pools along Aucilla Creek near Boston, Thomas Co., *Harper*, no. 1636 (G, NY, US). FLORIDA: swampy pine barrens near Jacksonville, Duval Co., *Curtiss*, no. 5415 (G, NC, US); vicinity of Eustis, Lake Co., *Nash*, no. 437 (G, NY, P, US); moist pine barrens, Merritt's Island, Indian River, Brevard Co., *Curtiss*, no. 3149 (CU, G, NY, P, US); "wet weather pond" near Oakland, Orange Co., *Curtiss*, no. 6625 (G, NY, US); hammock, north of Eagle Bay near Kissimmee River, Osceola Co., *Small*, no. 9911 (CU); hammock, 12 miles east of Okeechobee City, Saint Lucie Co., *Small et al.*, no. 9292 (NY); everglades along the Palm Beach Canal, Palm Beach Co., *Small*, no. 8270 (G, NY); everglades along Tamiami Trail west of Miami, Dade Co., *Small*, no. 8835 (NY, type of *R. Edisoniana*); swamp, Big Pine Key, Monroe Co., *Killip*, no. 32075 (CU, G, NY); in everglades south of Tamiami Trail, Collier Co., *Moldenke*, no. 879 (D, NY); in pineland, vicinity of Fort Myers, Lee Co., *Standley*, no. 227 (G, NY); Indian Mound near Citrus Center, DeSoto Co., *Small*, no. 9911 (NY); in a pine barren pond, north of Palma Sola Bay, Manatee Co., *Simpson*, no. 122 (G); swamp, Polk Co., *Fredholm*, no. 6229 (US); Tampa, Hillsborough Co., May, 1876, *Garber* (US); in wet soil near Lake Butler, Pinellas Co., *O'Neill*, no. 2615 (CU); in a low pineland, Pasco, Pasco Co., *O'Neill*, no. 2616 (CU); margins of ponds in the pine barrens, Apalachicola, Franklin Co., *Chapman in Biltmore Herb.*, no. 211a (G, US); open moist soil on St. Vincent's Island, Franklin Co., *Correll*, no. 5604 (D). MISSISSIPPI: Horn Island, Jackson Co., *Tracy*, no. 2329 (NY); same locality, *Tracy*, no. 7682 (G); Ship Island, Harrison Co., June, 1886, *Underwood Herb.* (NY). LOUISIANA: in pine barrens, Mandeville, St. Tammany Parish, May, 1893, *Langlois* (Mo); west end of Grand Morais near New Iberia, Iberia Parish, *Brown*, no. 6383 (La). BAHAMAS: edge of fresh-water marsh, Southwest Bay, New Providence, *Britton & Brace*, no. 510 (NY); grows in tufts 5 miles west of Fresh Creek settlement, in a pothole a few rods from shore of a salt creek, Andros, *Wight*, no. 241 (G); pineland swamps, Eight Mile Bay, Abaco, *Brace*, no. 1863 (NY); water holes, West End, Great Bahama, *Brace*, no. 3533 (NY, US); marsh, Glass Window to Harbor Island, Eleuthera, *Britton & Millspaugh*, no. 5395 (NY); water hole, Orange Creek and vicinity, Cat Island, *Britton & Millspaugh*, no. 5781 (NY); Hog Island, *Wilson*, no. 8429 (NY); water hole, Stopper Hill, Crooked Island, *Brace*, no. 4832 (NY). CUBA: edge of coastal swamps, La Coloma, Pinar del Rio, *Ekman*, no. 17835 (NY); pineland ditch, Pinar del Rio City, Pinar del

Rio, *Britton, Britton & Gager*, no. 7250 (NY); in coastal swamps, Playa de Guanimar, Habana, *Ekman*, no. 18314 (G, NY); muddy soil, west coastal savanna, Batabano, Havana, *Britton, Cowell & De La Torre*, no. 13349 (NY, US); in shrubbery, Cienaga de Zapata, Santa Clara, *Ekman*, no. 18372 (US); *Wright*, no. 230 (NY, labeled by Gray "*R. Torreyana* Gray var." and annotated by Britton as "*R. Torreyana* var. *microrhyncha* A. Gray cotype"); *Wright*, no. 3785 (G, NY, US). Puerto Rico: marsh, Laguna del Tortuguero, *Britton & Britton*, no. 8128 (NY, US).

The more robust specimens of *R. microcarpa* cannot be superficially distinguished from specimens of *R. schoenoides*. The differences between the two species are in their achenes. That of *R. microcarpa* is surrounded by stiffly erect bristles which are shorter than the achene or equal to the tubercle in height. The achene itself is commonly biconvex, castaneous to dark brown, strongly and irregularly alveolate. The achenial bristles of *R. schoenoides* are usually divergent, exceeding the tubercle in height. Unlike the common condition in *R. microcarpa*, the achene is strongly flattened, and pale to castaneous. The alveoli are longitudinally compressed and appear as nearly regular rows of striae between a few prominent transverse ridges.

On the continent, *R. microcarpa* occurs most commonly in Florida with a few collections from North Carolina, southern Georgia, and the coastal areas of Mississippi and Louisiana. *R. schoenoides*, on the other hand, occurs on the Coastal Plain from North Carolina to eastern Texas exclusive of the Florida Peninsula.

68. R. Torreyana Gray. Caespitose: leaves slenderly linear, 2–3 mm. wide, flat or involute on drying, forming a stiff basal tuft; tips triquetrous, with finely serrated margins: culms subterete, slender, becoming flexuous, 0.5–1 m. high: cymes 2–3, decompound, fasciculate, corymbiform, 1–3.5 cm. wide; the filiform branchlets somewhat spreading: spikelets ovoid, 3–6-flowered, 1–5-fruited, pedicellate, mainly ascending, 4 mm. long: scales loosely imbricate, papery, castaneous, aristate: bristles 6, not exceeding ⅔ the achene in height, upwardly serrulate: achene obovate, to oblong-obovate in outline, extremely flattened, with the compressed alveoli appearing as fine glistening striae between the irregular transverse ridges, chestnut-brown, 1–1.2 mm. wide, 1.3–1.7 mm. long: tubercle deltoid, apiculate, compressed, decurrent, scurfy, 0.3 mm. in height. Plate 834, figs. 3A and 3B; Map 80.—Ann. Lyc. N. Y. iii. 197, pl. 6, fig. 2 (1835); Gray, Man. 532 (1848); Chapman, Fl. So. U. S. 524

(1860); Britton & Brown, Ill. Fl. i. 280, fig. 659 (1896); Britton, Man. 186 (1901); Small, Fl. 197 (1903) and Man. 184 (1933); Robinson & Fernald in Gray, Man. ed. 7: 200, fig. 317 (1908); Fernald, RHODORA, xxxix. 327 (1937). *R. micrantha* sensu Gray, Gram. et Cyp. i. no. 96 (1834), in part[1] and excl. syn. *Phaeocephalum Torreyanum* House, Am. Midland Nat. vi. 202 (1920).—Sandy pond-margins and sandy and peaty depressions in pinelands and savannas of the Coastal Plain from Cape Cod, Massachusetts, to Georgia. MASSACHUSETTS: damp sandy and peaty border of Israel Pond, Barnstable, Barnstable Co., *Fernald*, no. 8958 (G, NE, NY, P); Sconset, Nantucket Island, Nantucket Co., *Bicknell*, no. 1051 (NE, NY). RHODE ISLAND: sandy and gravelly shore of small double pond east of Long Pond, South Kingstown, Washington Co., *Collins & Fernald*, no. 11317 (G, NE). NEW YORK: damp meadow, Amityville, Suffolk Co., *Ferguson*, no. 7873 (G, NY). NEW JERSEY: White Horse, Mercer Co., *Stone*, no. 6756 (P); Quaker Bridge, Burlington Co., Aug. 1833, *Gray* (NY, TYPE); wet sandy clearing in barrens along tracks of C. R. R. of New Jersey, 1½ miles northeast of Atsion, Burlington Co., *Hermann*, no. 3556 (G); boggy swale near headwaters of Cooper Creek, Lindenwold, Camden Co., *Long*, no. 26371 (P); Egg Harbor, Atlantic Co., July 20, 1897, *Lippincott* (G); sandy clayey border of pond-hole, 1½ miles n. n. e. of Olivet, Salem Co., *Long*, no. 47085 (P); moist pine barrens, Swain, Cape May Co., *Mackenzie*, no. 7193 (NY). DELAWARE: Felton, Kent Co., *Canby* (G, P); wet pine barrens near Laurel, Sussex Co., Aug. 5, 1874, *Commons* (P). MARYLAND: wet thickets along Snow Hill Road, 7½ miles southeast of Salisbury, Wicomico Co., *Tatnall*, no. 4371 (G); meadows, Ocean City, Worcester Co., July, 1893, *Canby* (US). VIRGINIA: wet pineland south of Petersburg, Prince George Co., *Fernald & Long*, no. 8609 (G, P); argillaceous and sphagnous bog (Reams Bog) south of Burgess, Dinwiddie Co., *Fernald & Long*, no. 8998 (CU, G, P); sandy and peaty depression (exsiccated shallow pond) about 4 miles northwest of Homeville, Sussex Co., *Fernald & Long*, no. 6076 (G, P); damp clearing in woods along Wakefield Road northeast of Sebrell, Southampton Co., *Fernald & Long*, no. 10547 (G, NY, P); sphagnous bog about 1 mile northwest of Dahlia, Greensville Co., *Fernald & Long*, no. 8609 (G, P). NORTH CAROLINA: dry savanna, 15 miles southeast of Greenville, Pitt Co., *Blomquist*, no. 11229 (D); dry pine woodland at Nashville, Nash Co., *Godfrey*, no. 5155 (D, G); mossy floor of pine woodland, Raleigh, Wake Co., *Godfrey*, no. 4924 (G, NC);

[1] No. 96 was apparently made up from a mixed collection. In the volume belonging to the library of the New York Botanic Garden, no 96 is *R. Torreyana*, as stated by Gray in an appended correction; but in the volume at the Gray Herbarium, no. 96 is *R. gracilenta* Gray.

wet open sand pits, 5 miles west of Swanquarter, Hyde Co., *Wiegand & Manning*, no. 629 (G); savanna at Chocowinity, Beaufort Co., *Godfrey*, no. 5400 (G); pineland at Roseboro, Sampson Co., *Godfrey*, no. 5712 (G); edge of savanna, low ground, Big Savannah, west of Burgaw, Pender Co., *Blomquist*, no. 10067 (CU, D); Wilmington, New Hanover Co., Aug. 19, 1930, *Blomquist* (G); dry sandy soil, Fayetteville, Cumberland Co., *Biltmore Herb.*, no. 5055b (US); damp open sand-pocket, 4 miles north of Hoffmann, Richmond Co., *Wiegand & Manning*, no. 630 (G). South Carolina: low pine woods, common, Society Hill, Darlington Co., *Curtis* (G); Camden, Kershaw Co., *House*, no. 2681 (US); cart-road through pineland clearing, 5 miles south of Andrews, Georgetown Co., *Godfrey & Tryon*, no. 1329 (G, NY); grass-sedge bog or savanna, 1 mile west of Chicora, Berkeley Co., *Godfrey & Tryon*, no. 851 (CU, D, G, NY, P); grass-sedge bog or savanna, 3 miles southwest of Manning, Clarendon Co., *Godfrey & Tryon*, no. 939 (G). Georgia: rather dry pine barrens near Pulaski, Bullock Co., *Harper*, no. 941 (G, NY, US); pine barren at Ways, Bryan Co., *Eyles*, no. 6419 (CU); moist pine barrens west of Ochmalkee, Montgomery Co., *Harper*, no. 1868 (G, NY, US).

69. R. perplexa Britt. ex Small. Caespitose: leaves flat, 1–2 mm. wide, minutely serrulate along the upper margins; tip triquetrous: culms slender, flexuous, obtusely 3-angled, 0.5–1.1 m. high: cymes 1–3, decompound, fasciculate, loosely corymbiform or rarely congested, flexuous, the terminal cyme 2–5.5 cm. high: spikelets ovoid-orbicular, turgid at maturity, 3–5-flowered, 2–4-fruited, 2–2.5 mm. long, usually crowded in a few small ultimate fascicles: scales ferruginous or blackened, broadly ovate, usually blunt or occasionally mucronulate: bristles none, or represented by 1–3 rudiments not equalling ½ the achene in height, these upwardly hispidulous: achene obovate to suborbicular in outline, flattened, 0.9–1.2 mm. wide, 1–1.3 mm. long; the surface crossed by a few prominent transverse ridges which are separated by numerous slender longitudinal striae, castaneous: tubercle broadly deltoid, apiculate, compressed, pale, 0.2–0.3 mm. high. Plate 832, figs. 3A and 3B; Map 81.—Fl. 197, 1328 (1903) and Man. 184 (1933); Fernald, Rhodora, xl. 399 (1938). *R. microcarpa* Baldw., var. *achaeta* E. Hall, Pl. Tex. 25 (1873), *nomen nudum*. *Phaeocephalum perplexum* House, Am. Midland Nat. vi. 202 (1920).—Coastal Plain from southeastern Virginia south to Florida and west to eastern Texas, inland only in central Tennessee; also in western Cuba and southern Dominican Republic. Virginia: exsiccated argillaceous pond-hole in woods, about 1 mile south of Mercy Seat Church, Surry Co., *Fernald & Long*, no. 8989 (G, P); wet peaty depression in pinelands, 3–4 miles northwest of Waverly, Sussex Co., *Fernald &*

Long, no. 8115 (G, P); pond-hole in pine and oak woods near Three Creek, north of Emporia, Greensville Co., *Fernald & Long*, no. 9282 (G, P); in shallow water of flat pineland, Collier's Yard, 2½ miles south of Petersburg, Dinwiddie Co., *Smith & Hodgdon* in Pl. Exsic. Gray., no. 924 (CU, G, NY, P). North Carolina: drained grassy plain, 1 mile east of Delco, Columbus Co., *Wiegand & Manning*, no. 615 (G). South Carolina: common in savannas, Sumter Co., Aug. 4, 1884, *J. D. Smith*, (G, US); exsiccated pine-barren pond, 7 miles southeast from Columbia, Richland Co., Sept. 26, 1883, *J. D. Smith* (G, US). Georgia: swamp, Augusta, Richmond Co., *Ruthbert*, no. 343 (NY); gum-swamp along U. S. Route 17, south of Ways, Bryan Co., *Eyles*, no. 6285 (CU); margin of pond, north of Ludowici, Long Co., *Eyles*, no. 6526 (CU); dry soil, Valdosta, Lowndes Co., May 27, 1940, *Sargent* (Sargent Herb.); wet clay holes, 5 miles west of Tifton, Tift Co., *Svenson*, no. 7087 (G); shallow (now dry) pine-barren pond near Cobb, Sumter Co., *Harper*, no. 1403 (G, NY, US); margin of pond in pine barrens, 7 miles north of Cordele, Dooly Co., *Eyles*, no. 2303 (CU). Florida: *Chapman*, no. 2 (NY, type); swampy places in pine barrens near Jacksonville, Duval Co., *Curtiss*, no. 5178 (G, US); pinelands, Starke, Bradford Co., May, 1923, *Wyman* (NY); prairies near Ft. Shackleford, Big Cypress, Lee Co., *Small*, no. 8352 (NY); Ponce de Leon, Holmes Co., *Curtiss*, no. 6482 (G, NY, US). Alabama: pond, Elberta, Baldwin Co., July 15, 1926, *Wolf* (StB); low wet places, Mobile, Mobile Co., *Mohr*, no. 142 (US). Mississippi: Mississippi City, Harrison Co., *Lloyd & Tracy*, no. 379 (NY). Tennessee: wet open woods bordering a bog north of Manchester, Coffee Co., *Svenson*, no. 9139 (CU, D, G, NY). Louisiana: in pine barrens near Mandeville, St. Tammany Parish, May 1, 1893, *Langlois* (CU, Mo, P, US); Lake Charles, Calcasieu Parish, *Tracy*, no. 4882 (Mo, NY, US). Texas: in a pond three miles below Town Bluff, Tyler Co., *Wright*, no. 102 (G); ponds, Hempstead, Waller Co., *Hall*, no. 710 (G, type of *R. microcarpa* Baldw. ?var. *achaeta* Hall, nomen nudum; Mo, US, isotypes). Cuba: border of lagoon, vicinity of Pinar del Rio City, Pinar del Rio, *Britton, Britton & Gager*, no. 6962 (NY); banks of lagoon, El Punto, east km. 11 of road to La Coloma, south of Pinar del Rio, *Ekman*, no. 18262 (NY. This number cited by Kükenthal as *R. microcarpa* A. Gray). Hispaniola: in the Rhexia belt, near Laguna de los Derramaderos, Sabana Guabatico, prov. Santo Domingo, Llana Costero, Santo Domingo, *Ekman*, no. 13320 (NY. Determined by Kükenthal as *R. microcarpa* A. Gray.).

The description above differs in two important details from the original description which appeared in Small's Flora of the

Southeastern United States. The original reads: "perianth bristles 6" and "achenes biconvex." In his Manual of the Southeastern Flora neither of these statements reoccur. I am inclined to believe that they were erroneously included in the original, probably due to a mixture in the material under study. The type-specimen is clearly *R. perplexa* as described above, the achene being extremely flat, not biconvex, and the bristles 1–3 and rudimentary.

Series 12. **Glaucae** (Clarke), stat nov. Growing in marshy areas, grassy slopes, and open woodland of the West Indies (represented by *R. californica* in the coast ranges of northern California); also in Central and South America and warmer parts of the Old World. Caespitose, rarely depressed: leaves 1.5–3 mm. wide: culms slender to stout, stiffly erect or becoming flexuous: cymes compound or decompound, fasciculate; the branchlets rigidly erect and spreading or flexuous: spikelets sessile, 1–3-fruited: scales loosely imbricated: bristles equalling the achene or exceeding the tubercle, antrorsely serrulate: achenes broadly or slenderly pyriform, a shining yellow-brown or light brown; the surface alveoli reduced to longitudinal striae which are intercepted by transverse corrugations or vague and blurred rugulosities: tubercle deltoid, compressed, often attenuated.—*Rhynchospora*, Series B. *Diplostyleae*, Sect. 5. *Glaucae* Clarke in Urban, Symb. Ant. ii. 106 (1900), in part.

Key to Species in Series Glaucae

Tubercle deltoid-attenuate, well exceeded by the bristles: achene with the transverse rugulosities and fine striae blurred to often nearly smooth.
  Achene 1.4 mm. wide, 2 mm. long; scales caducous: species known only from the coast ranges of northern California. 70. *R. californica.*
  Achene 1.2 mm. wide or less, 1.6 mm. long or less: scales persistent: species not known north of the West Indies.
    Habit coarsely erect: culms 0.6–1.4 m. high: fasciculate cymes loosely decompound, 2.5–4 cm. wide, with slender elongate flexuous branchlets: achene 1–1.2 mm. wide, 1.4–1.6 mm. long.......71. *R. Mariscus.*
    Habit depressed: culms 0.3–1.2 dm. high: fasciculate cymes decompound, small and congested, 1–1.5 cm. wide with short, stiffly erect or somewhat spreading branchlets: achene 0.9 mm. wide, 1.1 mm. long.......72. *R. cacuminicola.*
Tubercle deltoid, equalled or slightly exceeded by the bristles: achene corrugate.......73. *R. rugosa.*

70. R. **californica,** sp. nov. Planta caespitosa: foliis 2–3 mm. latis planis, apice triquetris; marginibus superioribus minutissime dentatis: culmis fere 1 m. longis trigonis tenuibus apicem versus flexuosis: fasciculo terminali decomposito stricto

2 cm. lato aut minus; ultimis glomerulis in ramulis brevibus tenuibus rigidisque gestis; fasciculis lateralibus minoribus; pedunculis longis ascendentibus: spiculis late ovatis, floribus tribus sed cum flore quarto terminali abortivo, dicarpis 4 mm. longis: squamis aristulatis, valde caducis: setis 6–7, antrorse hispidulis tuberculo longioribus basi latioribus et sparse plumosis: achaenio obovato lenticulari biconvexo obscure marginato lucido pallido obscure ruguloso 1.4 mm. lato 2 mm. longo: tuberculo attenuato-deltoideo 1 mm. alto. PLATE 834, FIGS. 1A and 1B; MAP 60.—Marsh in the foothills of the coastal ranges of northern California. CALIFORNIA: Pitkin Marsh, 5 miles north of Sebastopol, Sonoma Co., July 26, 1936, *J. T. Howell*, no. 12679 (G, TYPE; CA, ISOTYPE).

This fine new species was collected and sent to me for study by Mr. John Thomas Howell of the California Academy of Science. Its large pale achene rendered conspicuous by the caducous scales is unmistakable and unique among the species of the United States. The light yellowish surface with the faint blurred rugulosities recalls that of *R. MariscuIus* Lindl. et Nees in Mart.; whereas the habit is slighter but not unlike that of *R. rugosa* (Vahl) Gale.

In all probability, if the status of specimens which have been collected in Central and South America as well as in the warmer areas of the Old World and which have been identified as *R. glauca* (*R. rugosa* (Vahl) Gale), be given a much needed revision the relationship of *R. californica* to the Series *Glaucae* could be more clearly defined.

71. R. MARISCULUS Lindl. et Nees. Coarsely caespitose: leaves 2–3 cm. wide, stiffly ascending with attenuated, triangular serrated tips: culms stoutly ascending, 3-angled, leafy, 0.6–1.4 m. high: cymes fasciculate, 1–3, loosely decompound, 2.5–4 cm. wide, flexuous; axillary cymes on ascending exserted peduncles: spikelets lanceolate in outline, loosely organized, 1–4-flowered, 1–2-fruited, 5–6 mm. long: scales lanceolate-aristulate, loosely overlapping, dark brown: bristles 6, upwardly serrulate, finely attenuated, irregularly ascending to spreading and contorted, well exceeding the tubercle in length: achene obovoid, sometimes slenderly so, biconvex with a depressed margin, light yellow-brown, 1–1.2 mm. wide, 1.4–1.6 mm. long; the minute longitudinal striae and transverse rugulosities blurred: tubercle triangular-attenuate, compressed, 1.2–1.8 mm. long. PLATE 835, FIGS. 3A and 3B; MAP 61.—Nees, Linnaea, ix. 297 (1835), *nomen nudum;* Kunth, Enum. ii. 303 (1837), cited as "Sp. mihi

nonnisi nomini notae."; Nees in Mart., Fl. Bras. ii. pars 1: 142 (1842), first valid publication; Boeckeler, Linnaea, xxxvii. 590 (1873); C. B. Clarke in Urban, Symb. Ant. ii. 132 (1900), excl. syn. *R. odorata* C. Wright and *R. jubata* Liebm.; Britton & Wilson, Sci. Surv. Porto Rico and Virgin Isl. v. 105 (1923); Kükenthal, Fedde Rep. Spec. Nov. xxxii. 77 (1933). *R. tenuiseta* Wright in Sauvalle, Anal. Acad. Ci. Habana, viii. 83 (1871) and Fl. Cub. 179 (1873). *R. borinquensis* Britton, Bull. Torr. Bot. Cl. xlii. 387 (1915); Britton, Mem. Soc. Cubana Hist. Nat. ii. 200 (1916); Britton & Wilson, Sci. Surv. Porto Rico and Virgin Isl. v. 104 (1923). *Dichromena Marisculus* Macbride, Field Mus. Pub. Bot. xi. 5 (1931).—In damp openings of woodland, Greater Antilles. Jamaica: Guy's Hill, St. Mary's, 1839, *McNab* (G). Cuba: in tembladeras, in a swamp just to the east of Laguna de la Maguina, Pinar del Rio City, Pinar del Rio, *Ekman*, no. 17883 (NY); *Wright*, no. 3780 (G, type of *R. tenuiseta* Wright in Sauvalle; NY, US, isotypes); wet soil among rocks in stream, Arroya del Medio above the falls, Oriente, alt. 450–550 m., *Shafer*, no. 3231 (NY); damp woods near sphagnum, Sierra Nipe near Woodfred, Oriente, alt. 450–550 m., *Shafer*, no. 3453 (NY); in thickets on path from Woodfred to Piedra Gorda, Sierra de Nipe, Oriente, *Ekman*, no. 15247 (US); La Prenda, Oriente, *Hioram & Manuel*, no. 4671 (NY). Hispaniola: silt flats, moist ground, Sabana Nueva, Lomas de la Mediania, San Juan, prov. de Agua, Cordillera Central, Santo Domingo, *Ekman*, no. 13601 (G, NY, US); on tembladera, in a laguna, Cuenca, Santo Domingo, Llano Costero, Santo Domingo, *Ekman*, no. 10982 (US). Puerto Rico: open wet places in forest, Sierra de Naguabo, Rio Icaco and adjacent hills, alt. 465–720 m., *Shafer*, no. 3515 (NY, type of *R. borinquensis* Britt.).

R. jubata Liebm. was confused by C. Wright with his *R. tenuiseta*, and so continued on in the synonymy of *R. Marisculus* by C. B. Clarke. I have examined a specimen of Liebman's from S. Antonio, Huatusco, which is the type-locality as given in Mexicos Halvgraes,[1] and believe it to represent a distinct species. It differs from *R. Marisculus* both in its pronounced lax, more tenuous habit, and in its achene, which is distinctly cencellate and rugulose, surrounded by six stiffly erect bristles that equal but do not exceed the tubercle in length. Proof of this opinion rests, however, on the examination of more Mexican material.

An examination of the New York collections of *R. Marisculus* leads me to believe that *R. borinquensis* Britt. owes its existence

[1] Ibid. 67 (1850).

to Britton's mistaken application of the name *R. Marisculus* Lindl. et Nees to specimens of *R. odorata* Wright.

72. R. **cacuminicola,** sp. nov. Planta humilis caespitosa: foliis 1–2 mm. latis subcoriaceis leviter carinatis; apicem versus serratis triquetris, basi confertis, culmo brevioribus: culmis obtuse triangularibus 0.3–1.2 dm. altis: cyma terminali decomposita; ramulis brevibus rigide erectis vel ascendentibus fasciculis terminalibus parvis confertis; fasciculo laterali approximato; pedunculo ascendenti: spiculis lanceolatis 4–4.5 mm. longis 2–3-floris 1–2-carpis sessilibus congestis: squamis acutis vel fere aristulatis ferrugineis margine erosis: setis 6–7, quam tuberculum multo longioribus antrorse hispidulis: achaenio pyriformi 0.9 mm. lato 1.1 mm. longo lenticulari biconvexo marginato luteo-castaneo, obsolete ruguloso: tuberculo compresso-subulato, attenuato, 1–1.2 mm. longo. PLATE 835, FIGS. 2A and 2B; MAP 62.—Marshy areas in Cordillera Central of the Dominican Republic. DOMINICAN REPUBLIC: in pratis paludosis in valle nuevo, prope Constanza, alt. 2200 m., June, 1910, *Türckheim*, no. 3417 (NY, TYPE).

Von Türckheim's specimen is accompanied by an annotation which implies that this species is only an alpine variety of *R. glauca* Vahl (*R. rugosa* (Vahl) Gale). That it is not a depressed form of *R. rugosa*, however, is attested by the achene which is smaller than that of the latter (0.9 mm. wide, 1–1.1 mm. long as opposed to 1.2–1.3 mm. wide, 1.5–1.7 mm. long), and only obscurely rugulose, with definite but short inconspicuous basal stipe. Also the tubercle of *R. cacuminicola*, unlike the short triangular tubercle of *R. rugosa*, is prolonged, with a subulate tip, and well exceeded by the bristles.

Despite the depressed habit, the reduced stiffened inflorescence and its original reference by von Türckheim to *R. rugosa*, *R. cacuminicola* seems more closely allied to *R. Marisculus;* for in the surface sculpturing of the achene, the comparative length of the bristles and the shape of the tubercle, its achene is to that of the latter species a faithful although much smaller copy.

I have selected for this plant the epithet, *cacuminicola*, in order to signify its mountainous habitat, originally emphasized by von Türckheim.

73. R. **rugosa** (Vahl), comb. nov. Coarsely caespitose: leaves 1.5–3 mm. wide, coarse, ascending to reflexed, flat, carinate, with trigonous serrated tips: culms triquetrous, stout, erect, somewhat flexuous at the summit, leafy, 0.5–1.3 m. high:

fasciculate cymes 1–3, strict, with stiffly erect or somewhat spreading branchlets, 1–2 cm. high: spikelets acutely ovoid, 4.5–5 mm. long, sessile or subsessile; scales ovate-aristate, rather loosely imbricate, ferruginous: bristles 6, upwardly serrulate, ascending or often divergent, equal to or slightly exceeding the tubercle: achene broadly pyriform, 1.2–1.3 mm. wide, 1.5–1.7 mm. long, lenticular, biconvex, with depressed margins, glistening yellow-brown; the longitudinal surface-striae obscured or nearly obliterated by the transverse broad, flattened, often pale corrugations; the thick persistent stipe 0.3 mm. long: tubercle triangular-subulate, compressed, smooth or somewhat setulose at the base, 0.6–0.8 mm. long. Plate 835, figs. 1A and 1B; Map 63.—*Schoenus rugosus* Vahl, Eclog. Am. ii. 5 (1798). *R. glauca* Vahl, Enum. ii. 233 (1806); Boeckeler, Linnaea, xxxvii. 585 (1873); Britton, Trans. N. Y. Acad. Sci. xi. 91 (1892), excl. syn. *R. pungens* Liebm.; Clarke in Urban, Symb. Ant. ii. 128 (1900), excl. syn.; Britton, Mem. Soc. Cubana Hist. Nat. ii. 199 (1916); Britton & Wilson, Sci. Surv. Porto Rico and Virgin Isl. v. 104 (1923); Kükenthal, Fedde Rep. Spec. Nov. xxiii. 210 (1926). *R. glauca* var. *altior* Kükenthal, Fedde Rep. Spec. Nov. xxxii. 77 (1933). *R. gracilis* sensu Grisebach, Fl. Brit. W. I. 574 (1864), in part, and Cat. Pl. Cub. 243 (1866), in part; C. Wright in Sauvalle, Anal. Acad. Ci. Habana, viii. 84 (1871) and Fl. Cub. 179 (1873); non (Swartz) Vahl. *Dichromena glauca* Macbride, Field Mus. Pub. Bot. iv. 166 (1929).—Mostly on damp open grassy slopes of the Greater Antilles, and of the Island of Dominica; also in South and Central America and Lower Mexico. Cuba: banks of small streams, Loma Ratones, Rio San Sebastian, La Cumbre, north of San Juan y Martinez, Pinar del Rio, *Ekman*, no. 18062 (NY, US). Jamaica: along the trail, Mt. Airy, *Maxon*, no. 852 (US); in the morass, Pedro Morass, Upper Clarendon, alt. 3000 ft., *Harris*, no. 11169 (G, NY, US); on wet hillside, Peckham, Upper Clarendon, alt. 2000 ft., *Harris*, no. 12810 (G, NY, US); amongst grasses in wet hillside pastures, Troy, alt. 2000 ft., *Harris*, no. 12590 (G, NY, US). Hispaniola: eruptive slope, Haut-Piton, Port-de-Paix, Massif du Nord, Haiti, alt. 800 m., *Ekman*, no. 4638 (G, NY, US); Petit Borgne to Mt. Casse, Haiti, alt. 200 ft., *Nash*, no. 558 (NY); grassy mountain trail to Citadel, vicinity of Dondon, Depart. du Nord, Haiti, alt. 400 m., *Leonard*, no. 8643 (US); grassy summit of mountain east of village, vicinity of Marmelade, Depart. du Nord, Haiti, alt. 800 m., *Leonard*, no. 8241a (US); pineland, Lagunas de Cenobi, Moncion, Monte Cristi, Cordillera Central, Santo Domingo, c. alt. 1100 m., *Ekman*, no. 12762 (NY, US). Puerto Rico: in thickets, Las Mesas, near Mayaguez, alt. 350 m., *Holm*, no. 64 (CU), Aguada, *Sintenis*, no. 5742 (US); in graminosis, Lares, *Sintenis*, no. 5901 (G, US); low ground back

S. G. del.

Rhynchospora californica: fig. 1A, portion of inflorescence, × 2; fig. 1B, achene, × 20.
R. schoenoides: fig. 2A, portion of inflorescence, × 2; fig. 2B, achene, × 20.
R. Torreyana: fig. 3A, portion of inflorescence, × 2; fig. 3B, achene, × 20.

S. G. del.

Rhynchospora rugosa: fig. 1A, inflorescence, × 2; fig. 1B, achene, × 20.
R. cacuminicola: fig. 2A, inflorescence, × 2; fig. 2B, achene, × 20.
R. Marisculus: fig. 3A, portion of inflorescence, × 2; fig. 3B, achene, × 20.

of Catano, *Heller*, no. 6410 (CU, NY, US); road from Rio Piedras to Trugillo alto, *Hioram*, no. 806 (NY, US); Cidra, Feb. 28, 1928, *Perkins* (NY); on rock by falls in river, Rio Icaco and adjacent hills, Sierra de Naguabo, *Shafer*, no. 3534 (NY, US). DOMINICA: common in cleared pasturelands on deep rich soils of Milton Estate, ca. alt. 530 m., *Hodge & Hodge*, no. 2608 (G). SOUTH AMERICA: America Meridionali,[1] *Rohr in Vahl Herb.* (G, TYPE-PHOTO).

The species, *Schoenus rugosus*, was published with full description by Vahl in his Eclogae Americanae, ii. 5 (1798). However, when, in the Enumeratio Plantarum of 1806, he transferred the species to *Rhynchospora*, he unfortunately chose to give it a new name, and it appeared as *R. glauca*. The old name, *Schoenus rugosus*, was then given in synonymy, accompanied by the original description and citation, "Habitat in America meridionali. von Rohr". Since the specific name, *rugosa*, is available for use under *Rhynchospora*, the new combination *R. rugosa* (Vahl) Gale takes precedence over *R. glauca* Vahl.

The range of this species has been generally given as warmer regions of both hemispheres. However, the specimens from the East Indies and adjacent continental lands which have been commonly identified as *R. glauca*, are not, I believe, conspecific with the authentic *R. glauca* Vahl (*R. rugosa* (Vahl) Gale) of the West Indies, Central and South America. Although these Asiatic plants are closely related to and have the same general aspect as *R. rugosa*—the coarse growth and strict, compound fascicles with mainly ascending, sessile spikelets in small ultimate clusters—their achenes are larger, more nearly orbicular rather than pyriform, and the surface of the achene is generally castaneous, pitted, and finely ridged, without the prominent yellowish band-like corrugations which characterize the achenes of *R. rugosa*.

The Gray Herbarium isotype of Liebman's[2] *R. pungens*, Mirador, July, bears the annotation *R. glauca* Vahl followed by Britton's initials. The specimen itself is fragmentary and the surface details of the mature achenes are obscured by what appears to be an unnatural whitish coating. However, careful examination seems to indicate that the achenes are normally cancellate to

[1] Probably along the coast of Colombia or of French or Dutch Guiana. See Lamarck, Encycl. Meth. Bot. viii. 754 (1808).

[2] Mexicos Halvgraes, 65 (1850).

nearly smooth, with only a suggestion of transverse rugosity. In addition, the tubercle is plainly spongy and tongue-shaped rather than strongly compressed and triangular-subulate. If these observations can be confirmed through better material, *R. pungens*, although closely related to *R. glauca*, will retain its specific status.

PARONYCHIA IN CENTRAL AND WESTERN TEXAS

V. L. Cory[1]

I was considerably puzzled when my three numbers (34663 from a slope at the head of the Sabinal Canyon in Bandera County, 35036 from the southern part of Sutton County, and No. 35642 from the vicinity of the Devil's Sink Hole in Edwards County) were determined by a botanist checking my determinations as every one being *Paronychia Lindheimeri* Engelm. No. 35036 was known to differ from the others in being of perennial growth and in being our common species, *P. Jamesii* T. & G. The other two species agree with *P. Lindheimeri* in being annuals, but they seemed to me to be too much different to be thrown together as representatives of one variable species. In this bewilderment my material was sent to Dr. I. M. Johnston of the Arnold Arboretum, and he referred my No. 34663 to *P. setacea* T. &.G. and No. 35642 to *P. chorizanthoides* Small. Although finding myself able to agree with these determinations my material subsequently was sent to Dr. E. L. Core of the University of West Virginia, whose publication, *The North American Species of Paronychia*, is considered as authoritative. He agreed with the determinations of Dr. Johnston. In this connection material of two other species was sent to both of these gentlemen, and both are in agreement in the probability that two new species are represented.

The only annual species of Paronychia I have seen on the summit of the Edwards Plateau is *P. chorizanthoides*, and No. 35642 is my westernmost locality of collection. In September of 1942 I met up with an annual Paronychia growing in abundance on the summit of the Davis Mountains, about 6½ airline miles west-northwest of Alpine in Brewster County, and the

[1] Range Botanist, Texas Agricultural Experiment Station.

collection made there bears the number 40432. On an airline the Brewster County locality is fully 200 miles west of the Edwards County locality, and is fully 3300 feet higher in elevation, and the soil is from igneous rocks instead of limestone. The western locality has an elevation in excess of 5600 feet. With my material of the three annual species of Paronychia before me together with the available descriptions of *P. Lindheimeri*, it is my conclusion that this annual plant from the summit of the Davis Mountains is a distinct species, that it is more nearly related to *P. chorizanthoides* than it is to *P. Lindheimeri*, and that it is proper to propose a name for it.

PARONYCHIA **monticola,** sp. nov. Annua, erecta, patens, latior quam altior, glabra; caulibus gracilibus, 10–15 cm. altis, 1–1.5 mm. crassis, basi vel ad 3 cm. supra basem ramosis, ramis plus minusve iteratim dichotomis; foliis setaceis, glabris, quam internodiis brevioribus, 1 cm. longis vel brevioribus, sessilibus; stipulis lanceolatis, argenteis, 4 mm. longis vel brevioribus; cymis solutis, supremis exceptis 2-partitis cymis partialibus pedunculatis, flore in dichotomia singulo, sessili vel breviter pedicellato; inflorescentiae ramis 2-bracteolatis, bracteis cum foliis congruentibus, superioribus diminutis, ultimis quam calyce brevioribus; calyce lineari-oblongo, 2.5 mm. longo vel paullo majore, viridi-luteo, basi striguloso; sepalis oblongis, intus cucullatis, 2 mm. longis vel ultra, apice cuspide ca. 0.25 mm. vel breviore insignitis.—No. 40432 is designated as the TYPE specimen. It is deposited at the Gray Herbarium. ISOTYPE material is deposited at the herbarium of the University of West Virginia.

Like *P. Lindheimeri* the foliage of *P. monticola* is glabrous, but otherwise its relationship is more nearly with *P. chorizanthoides*. It differs from the latter in being glabrous instead of puberulent, in being slender-stemmed and much smaller in growth, one-half or less the height and one-third or less the spread, in lacking a silvery appearance, in the arrangement of the inflorescence through the lack, in all but the uppermost cymules, of the sessile flower in between the two pedunculate clusters, in the cusp of the sepal being less than half as long, in the leaves and stipules being at least a third shorter, and especially in that the uppermost bracts do not surpass the calyx, whereas in *P. chorizanthoides* the bracts not only surpass the calyx but also surpass the pedunculate clusters.

In *The North American Species of Paronychia* by Dr. Earl L.

Core, *P. scoparia* Small is included with *P. virginica* Spreng., with two widely separated centers of distribution shown, one being in northern Virginia and the other in North Central Texas. It is my opinion that the differences recognized by Dr. J. K. Small exist, perhaps not to the extent of justifying specific separation, but justifying the recognition of *scoparia* as a variety of *virginica*. Based upon *P. scoparia* Small, Bull. Torr. Club **24**: 335. 1897, I propose the combination,

P. virginica Spreng., var. **scoparia** (Small), new comb.

Material of a perennial species of Paronychia has been sent to me by my co-worker, Mr. H. B. Parks. In my judgment this plant is amply distinct from other described North American species. Dr. E. L. Core writes that he has seen nothing like it, and Dr. Johnston does not place it with a described species.

Paronychia **Parksii.** sp. nov. Perennis, dense caespitosa; caulibus rigidis, strictis, omnino erectis, inflorescentia excepta eramosis, ad 2 mm. crassis, 3.5–5.5 dm. altis, scabris puberulisque; foliis subulatis, mucronatis, 2–2.5 cm. longis, 1 mm. vel minus latis, infimis brevioribus, supremis quam internodiis longioribus, puberulis scabrisve; stipulis lineari-lanceolatis, longe attenuatis, argenteis, ab apice plus minusve profunde partitis, 6–10 mm. longis; cymis 6–8-ies dichotomis, diffusis, fastigiatis, plurifloris; bracteis cum foliis congruentibus, supremis calycem aequantibus; calyce 4.5–5 mm. longo, basi 1.5 mm. lato, ultra medium vix 0.75 lato, scabrido; sepalis linearibus, carinatis, saepius 2-nerviis, raro 3-nerviis, cuspidatis, viridi-luteis, cuspide 1 mm. longo vel longiore, intus subcucullato, margine scarioso brevi. —No. 41046, collected by Mr. H. B. Parks at ten miles north of Boerne in Kendall County, on August 15, 1942, is designated as the type specimen. It is deposited at the Gray Herbarium. Isotype material is deposited at the herbarium of the University of West Virginia and at the Tracy Herbarium of the A. and M. College of Texas.

This species grows further west and at somewhat higher elevation than does *P. scoparia*, with which it may be compared. It differs therefrom in being half again as tall or frequently twice as tall, in the stems being strictly erect instead of spreading, and in the sepals being 4–4.5 mm. long instead of 3–3.5 mm. long. Also the mature plant is reddish in coloration instead of yellowish as is *scoparia*. The above description is from fruiting material, for I have not seen this plant growing.

I wish to express grateful acknowledgment to Dr. Leon

Croizat for valuable assistance given in the preparation of the Latin descriptions.

Sonora, Texas.

A Note on Baptisia tinctoria, var. projecta.—When Professor Fernald (Rhodora **39:** 415. 1937) described *Baptisia tinctoria*, var. *projecta*, he cited specimens from Huntingdon County, Pennsylvania, and Bath County, Virginia. Dr. Larisey (Ann. Mo. Bot. Gard. **27:** 188. 1940) cited two additional collections from the Shenandoah National Park in Virginia. Both Fernald and Larisey gave the length of racemes in var. *projecta* as 3–4.5 dm., whereas they stated that the racemes of typical *B. tinctoria* are usually 1 dm. or less in length. Specimens in the Cornell University Herbarium from Oswego County, New York, have the racemes very short, 1–7 cm. long, and the flowers 11–13 mm. long. These contrast markedly with collections from Center and Huntingdon Counties, Pennsylvania, which have the racemes 21–30 cm. long and the flowers 13–15 mm. long. These last impress me as belonging to var. *projecta*, probably also a specimen from Newton, Sussex County, New Jersey, *J. P. Young*, June 15, 1919, which has a raceme 16.5 cm. long and flowers 14 mm. long. Possibly 15 cm. might make a more satisfactory lower limit than 30 cm. for the length of raceme of var. *projecta*. Most specimens of *B. tinctoria* have racemes well below that length. Those that are intermediate are very few. In the Cornell University Herbarium there are only two intermediate collections, one from Perry County, Pennsylvania, with flowers 13–14 mm. long and racemes 8–9 cm. long and another from Fairfax County, Virginia, with flowers 14–15 mm. long and racemes 5–10 cm. long. Otherwise, var. *projecta* seems like a reasonably distinct variety, probably genetically different from the smaller-flowered typical variety which regularly has short racemes. Var. *crebra*, on the other hand, though representing a tendency, seems scarcely tangible. Plants from Oswego County, New York, are almost indistinguishable in leaflets, flowers and fruits from specimens from the Coastal Plain of North and South Carolina. For that reason, perhaps the northern and southern plants are best all classed together as typical *B. tinctoria*.—Robert T. Clausen, Dept. of Botany, Cornell University, Ithaca, N. Y.

Abrams's Illustrated Flora of the Pacific States.—Not only the army of professional and amateur botanists of the Pacific States but all of us who have long appreciated the scholarly work of Professor LeRoy Abrams will breathe the easier now that the 2nd volume of his great Illustrated Flora[1] is actually out. The form has been changed, with all the line-drawings gathered into separate pages, a saving of both space and expense and, some will think, an improvement; and there is, most happily, a larger proportion of excellent and evidently accurate new illustrations, the first volume often predominantly with copied drawings (*Potamogeton*, the *Cyperaceae*, etc.). In the new volume these misfit, stiffer and often misleading drawings (for instance in *Lycopodium*, where the illustrations of *L. inundatum*, *L. complanatum* and *L. annotinum* are scarcely of typical forms of the species) seem relatively few, the small new drawings having evidently been planned by the author or a botanical helper, not left to the doubtful botanical acumen of the draftsman. They are, consequently, bound to be really helpful; the author and publisher are to be congratulated on the success with which they have come out on relatively unglazed paper. No one with half an eye for details can now go far astray in identifying his plants.

The treatments are conservative and the nomenclature and recognition of families, genera and species along the lines approved by the best international usage, though in debatable cases, like the recognition of *Parnassiaceae* and *Grossulariaceae* as families, the more liberal choice is made, with *Grossularia* and *Ribes* kept apart as genera (these treatments by Coville). On the other hand, *Astragalus* and *Potentilla* are kept intact. Other groups are treated by specialists: *Lupinus* kept down to 84 species by Charles Piper Smith, the many so-called genera of the *North American Flora* reassembled as the single genus *Saxifraga* by Rimo Bacigalupi, and *Ranunculus* very conservatively treated by Lyman Benson, while many recent propositions in that prolific source of supposed novelties, *Eriogonum*, are reduced, leaving the modest score of 80 recognized species. The treatments of some other groups by specialists are acknowledged.

In the treatment of the term "subspecies" which, especially in the western half of the United States has been debased from its proper and dignified status and made absolutely inseparable from the time-honored varietas, the author has left the user in perplexity. He personally calls geographic varieties and, one cannot help thinking, some mere forms, "subspecies" but side-by-side with them he admits, without transfer to that rank, variations which have been put out as "vars." Thus (p. 151) *Arenaria macradenia* has two variations described: var. *Parishiorum* Robinson (1894) and subsp. *Ferrisiae* Abrams, subsp. nov. Again, under *Eriogonum deflexum* (p. 34) we get "subsp. *Watsonii*", which "differs chiefly from the typical species in the more slender and longer . . . peduncles", not a degree of difference which is strikingly more significant than that shown in "var. *brachypodum*", next following it and "with the habit of the typical species . . . but the branches, peduncles and involucres glandular instead of glabrous", while of "var. *brachypodum*" we are told that "This subspecies ranges from Inyo County . . . to western Arizona and Lower California". Just such cases give the whole thing away. Some of our western friends who have suddenly adopted "subspecies" see no difference between them and the varieties of more conventional botanists of nearly two centuries, while they ignore the proper use of the dignified and long-used term subspecies for variations of much higher rank. It was hoped that in a work by so scholarly a student as Abrams this fad of the hasty, ill-advised and misinformed would get exposed. Just because a term is relatively new and is used by some zoölogists it does not follow that it is clearer, unless it really clarifies. The

[1] LeRoy Abrams. Illustrated Flora of the Pacific States, Washington, Oregon. and California. In four volumes, Vol. II. Polygonaceae to Krameriaceae. 1944 Stanford University Press, Stanford University, Calif. i–viii + 635 pp. $7.50.

user of this Illustrated Flora can only become needlessly and hopelessly perplexed. If his intellectual befuddlement is sufficient to make him wish some relief he might turn to RHODORA, xlii. 239–246 (1940) and ibid. xliv. 154–167 (1942), where the real meanings of these terms are discussed. He may not wish to be so "old-fashioned" as to follow long-established usage; he can, however, if he cares to do so, understand how confused have become some of our western friends and how far they have wandered off the beaten path.

Naturally the eastern botanists can hardly check the detailed treatments of strictly western groups. In cases of transcontinental or semi-cosmopolitan plants and those which were first described from one of the original 13 states, it is natural that he should note the treatments in groups which he has personally investigated. On p. 53 appears *Rumex persicarioides* with an illustration as fig. 1439 and the stated range: "British Columbia to southern California and across the continent. Closely related to *R. maritimus* L. of the Old World. Recently our plants have been referred to *R. fueginus* Philippi of Chile, by Rech. f. Field Mus. Bot. Ser. **17**: 136. 1937. Type locality: Virginia." Now, as distinctly shown by St. John, RHODORA, xvii. 73–80, pl. 113, figs. 5 and 6 (1915), *R. persicarioides* is strictly of the Atlantic coast, a very local and definite plant, now known only at scattered stations from the lower St. Lawrence to Virginia. The transcontinental plant, well illustrated by Abrams, was, I think correctly, treated and illustrated (his figs. 3 and 4) by St. John as *R. maritimus* var. *fueginus* (Phil.) Dusén, Svenska Exped. till Magellansl. iii. no. 5: 194 (1900). St. John also published from Washington State *R. maritimus* var. *athrax* St. John. This did not get noted in the new Illustrated Flora.

On p. 56 the synonym of *Polygonum Fowleri* Robinson is "*Polygonum Rayi*, American authors, not Babington". So far as *P. Fowleri* was originally misidentified as *P. Raii* that is correct, but it leaves the impression that the latter species is not American. That need not disturb the botanist of the Pacific coast but those who know the abundance of true *P. Raii* about the Gulf of St. Lawrence and in Nova Scotia might well wonder. The occurrence of *P. Raii* in America was emphasized in RHODORA, xv. 71, 72 (1913), xvi. 187, 188 (1914), xxiii. 150, 158, 165, 260 (1921).

Rorippa palustris (L.) Bess. appears on p. 278, but that name in the specific category goes back only to *Radicula palustris* Moench (1794). An earlier specific name was *Sisymbrium islandicum* Oeder (1768), validated by Murr. Nov. Comm. Gott. (1773), with the resultant correct combination, *R. islandica* (Oeder ex Murr.) Borbás. For detailed discussion see notes by the present reviewer in RHODORA, xxx. 131 (1928), xxxi. 17 (1929) and by Butters & Abbe, ibid. xlii. 26 (1940).

Aruncus vulgaris Raf. (1838) is taken up (p. 413) for all species of the genus, whether Eurasian or eastern or western American; but, as noted by the present reviewer in RHODORA, xxxviii. 181 (1936): "Under *Aruncus*, Rafinesque, in 1838, published two names: 'Type *A. vulgaris* and *Americanus*'. No diagnoses were given and no previous descriptions cited; the two names of Rafinesque are absolute *nomina nuda* and have no further nomenclatural status." The earliest specific name (except *Spiraea Aruncus* L.) in the whole series is *Actaea dioica* Walt. (1788), basis of *Aruncus dioica* (Walt.) Fernald, RHODORA, xli. 423 (1939). If Abrams does not care for the characters of flower and fruit pointed out and illustrated in RHODORA, xxxvii. pl. 416, and treats the genus as a monotype, there is no evident escape from *A. dioica*.

In the case of *Oxytropis deflexa* (Pall.) DC. (p. 613, fig. 2919) Abrams keeps up that name, based upon *Astragalus deflexus* Pall., who gave a beautiful plate of his species of Transbaikalia, with calyx-tube truncate, with broad rectangular sinuses between the short and setaceous teeth. Material from the type-region, in the Gray Herbarium, exactly agrees with Pallas's plate. It is not at all the North American plant which has erroneously passed as *O. deflexa*. The latter species, with long, lanceolate calyx-teeth and narrow sinuses, is *O. retrorsa* Fernald, RHODORA, xxx. 140 (1928).

One hesitates to speak of *Lathyrus maritimus* "(L.) Bigelow". If we could conserve specific names *L. maritimus* Bigelow would go into the first list, but not as "(L.) Bigelow", for, as shown in Rhodora, xxxiv. 184 et seq. (1932), "Bigelow in 1824 published as a wholly new species, *Lathyrus maritimus*, based on a wholly new type, the plant of the Boston region . . . , and particularly emphasized that the Boston plant is not the European *Pisum maritimum* because it is 'decidedly a Lathyrus.'" The detailed and necessarily intricate discussion need not here be quoted, but the earliest available name proved to be *L. japonicus* Willd. (1803), a name at present not particularly attractive. But, under the rules, *L. maritimus* is inadmissible, one of the unfortunate cases resulting from following rules.

A review, although legitimately noting the points with which the reviewer differs, should not, naturally, overstress these matters. Only one other such item will be noted: the taking up of *Potentilla pumila* (Rydb.) Fedde (1910). A glimpse into any eastern handbook (Britton & Brown, Britton's Manual, Gray's Manual or Small's Flora), to say nothing of the monograph of Wolf or Rydberg's monograph, would have revealed *P. pumila* Poiret (1804). The western species needs a new name.

Altogether the second volume of Abrams's Illustrated Flora is a wonderfully interesting, not to say provocative, book. In general its treatments are careful and evidently sound and its new illustrations are attractive and evidently painstakingly accurate. It is bound to be in great demand and every one interested in good old-fashioned "descriptive botany" will need it.—M. L. F.

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THE ANCYLATHERAN CALAMAGROSTIS OF EASTERN NORTH AMERICA

Father Louis-Marie, O.C.

(Plates 836 and 837)

The discovery at Mount Commis, in the Quebec Appalachian Range, some eight miles behind Rimouski City, of a new Calamagrostis belonging to a difficult group[1] necessitated the reexamination of the related species. *Calamagrostis Lepageana*, n. sp., pertains to Clarion's genus *Deyeuxia*[2] having the sterile rachilla prolonged on the side of its solitary flower[3] and a geniculate awn twisted below and longer than the glumes. For the species with long or short geniculate and twisted awn, so highly developed in western South America, in the mountains of Mexico and in the Cordilleran Range of North America, Ascherson & Graebner[4] have proposed the subsection *Ancylatherae*. The species of the other subsection (*Orthoatherae*), on the contrary, with straight awn and the lemma much longer (¼ to ⅓) than the palea, centering around the most aggressive and variable *Calamagrostis canadensis*, are copiously represented in eastern North America, while the former group, there very restricted geographically and specifically, takes the recessive attitude of

[1] Stebbins, Jr., G. L.—A Revision of some North American species of Calamagrostis. Rhodora **32**: 35–59, plate 195, 1930.

[2] Palisot de Beauvois.—1812. Essai d'une nouvelle Agrostologie, 43.

[3] The species of *Deyeuxia* with 2–3-flowered spikelets have been transferred to *Trisetum*, in the subgenus *Isoelytrum* Ls-Marie. Cf. The Genus Trisetum in America by the author, in Rhodora **30**: 209–23, 237–45 (1928).

[4] Ascherson & Graebner.—Synopsis der Mittel-Europaïschen Flora. II, part 1, pp. 197–223.

endemic species of the pre-Wisconsin dispersal with disrupted ranges.

Up to date, only four species have been recognized in eastern North America, as pertaining to the Deyeuxian type, with arista geniculate and twisted: *Calamagrostis Porteri* A. Gray, *C. perplexa* Scribn., *C. purpurascens* R. Br. and *C. Pickeringii* A. Gray. Professor Fernald has been interested for a long time in the last species and in its var. *debilis* (Kearney) Fern. & Wiegand.[1] He writes in Rhodora: "Dominant on peaty barrens at all levels in Newfoundland and Nova Scotia, it is absent from New Brunswick and most of Maine, but reappears in the alpine areas of Mt. Katahdin, the White Mts., the northern Green Mts. and the Adirondacks, whence it occasionally descends to the valleys . . . The range of the species is, emphatically, a disrupted one. The nearest allies of *C. Pickeringii* . . . , are *C. Porteri* Gray and *C. perplexa* Scribn. *C. Porteri* is one of the rarest of relic-species, with four isolated stations: one each, on rocky wooded slopes, in Chemung Co., New York; Huntington Co., Pennsylvania; and Page and Giles Cos., western Virginia. *C. perplexa* is even rarer: with the original station a bluff in Tompkins Co., New York, the other (for a similar but not quite identical plant) a quartzite cliff in Piscataquis Co., Maine.

"Also having a geniculate and exserted awn is the arctic *Calamagrostis purpurascens* R. Br., likewise with a remarkably disrupted range: the unglaciated margin of Greenland; arctic northwestern Canada, thence along the Cordillera to South Dakota, Colorado, Nevada and California; with the only known station in the East (south of Greenland), a single colony on one of the highest cliffs of Bic, Quebec."[2]

Thanks to the courtesy of the Director of the Gray Herbarium, the types of *C. Porteri* and *C. perplexa*, and the specimens from the other localitites mentioned in the above quotation have been sent to me for study and comparison. The material from the type locality for each species seems to be quite unique, and the other collections referred to it, that I have seen,[3] are not very

[1] Fernald, M. L. & K. M. Wiegand.—*Calamagrostis Pickeringii*, var. *debilis*, Rhodora **15**: 135–136 (1913).

[2] Fernald, M. L.—Recent Discoveries in the Newfoundland Flora. Rhodora **35**: 212–213. 1933.

[3] Hitchcock's Manual of Grasses of N. Amer. (1935) cites three localities: New Hampshire, White Mts.; Ontario (Lake Nipigon), Canada; Minnesota (Fond du Lac).

good matches, as the following short analysis should amply prove.

C. Porteri A. Gray, Proc. Amer. Acad. **6**: 79. Huntingdon County, Pa., *Porter,* Aug. 12, 1862 (type at the Gray Herbarium).

Prof. Thomas C. Porter, botanizing in Huntingdon Co., Pennsylvania, met for the first time his *Calamagrostis*, on August the 11th, and snatched up an incomplete specimen; this was on Warrior Ridge, at the spot called "Pulpit Rocks". The next day, and probably in the same place, he collected two complete plants which later on were taken as the type; on the label there is an important documentation: "*Calamagrostis Porteri*, n. sp. *Calamagrostis confinis*, Nutt.?[1] Near Alexandria, Huntingdon Co., Penn. Aug. 12, 1862 leg. T. C. Porter". On a second label, also in Porter's writing, we read: "*Calamagrostis confinis* Nutt.? The hairs at the base of the paleae are shorter than given in the description of the species and the leaves have a tuft of pubescence beneath the ligule. I found it not in a swamp, but in a dry wood on the side of a steep hill." This note, apparently cut from a letter to Asa Gray, written after the publication of *C. Porteri*, in a moment of not very good humour, beside adding a precious detail on the habitat, stresses two strategic characters, which since then have figured in the Floras, holding the aa and bb of the keys: the tuft of pubescence at the summit of the sheath and the abundance or shortness of the callus hairs.

Professor Porter returned to "Pulpit Rocks, Warrior Ridge" in August, 1864, and found an extremely large specimen of his species, with a strong culm, 2 mm. thick at summit, the inflorescence perfectly erect, interrupted and 22 cm. long. He returned to Huntingdon Co. eighteen years later, and recollected his *Calamagrostis* abundantly, on August 18, 1882.

The Gray Herbarium has two sheets of this collection. One is labelled by the collector: "near Barree, Huntingdon Co., Pa., in woods on hillsides." The specimen is nice and complete with very broad leaves, up to 9 mm. wide, and enough rhizome to show why the plant cannot grow in tussocks. As in *C. perplexa*,

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This collection (Wood's in 1899), the type of *C. breviseta*, var. *lacustris* Kearney, belongs to the *C. Pickeringii* group.

[1] *C. confinis* Nutt. (*Arundo confinis* Willd.), still described in the 6th. edition of the Gray's Manual (1890), is now placed in *C. inexpansa*, Gray. Beal retained it as *C. neglecta*, var. *confinis*.

the young shoots develop sympodially at the extremity of the horizontal section of the rhizome where no lateral branches are found. The second sheet, which came from the herbarium of Walter Deane through Charles Edward Faxon, carries a long and rather weak specimen. It is labeled: *Deyeuxia Porteri* (Gray) Vasey. Wooded hillside on Juniata R. [river], below Barree, Huntingdon Co., Pa." Now, this last bit of geography is useful. The Juniata River passes Alexandria and Barree through the Warrior Ridge. The station below Barree and that at Pulpit Rocks are both in the Warrior Ridge and near Alexandria, in woods on hillsides; they must be very near together, if not the same.

The five sheets of Porter's collections form a lot morphologically homogeneous. Typically, then, the species is a tall (1–1.30 m.) grass having blades 5–9 mm. broad and ligule 5–8 mm. long; the panicle, 11–22 cm. long, is generally interrupted below and long-exserted (14–28 cm.); the somewhat chartaceous glumes differ in length by 0.5 mm.; the lemma and palea are subequal, differing only by 0.2 mm., the awn (3 mm. long) is shorter than the glumes, as in *C. perplexa,* and protrudes only at the side of the spikelet; the hairs, nearly absent on the front of the callus, are few, but sometimes quite long, on its sides; the anthers are 2–3 mm. long and the young caryopsis red.

The other collections from Virginia and New York State do not all match the type. The nearest seems to be *Steele & Steele* no. 103, from Stony Man Mt., alt. 3600 ft., in the Blue Ridge, near Luray, Page Co., Virginia, Aug. 11, 1901. The plant is weaker than the type in all its characters: culm 69–74.4 cm. high, with blades 4–5 mm. broad; panicle 8.4–13 cm. long; the first glume about 1 mm. longer than the second; lemma 3.6 mm. long, palea 3 mm. long: these two last figures do not fit the definition of *C. Porteri.* The other number from Page Co. is a recent collection of July, 1935, from Mt. Marshall, alt. 900 m., in the Blue Ridge, *H. A. Allard,* no. 754. It is a tuft of nine flowering stems and of a few sterile shoots, sharing apparently the same much branched rootstock; the culm is wiry and very thin, less than 1 mm. in diameter under the panicle which is 7–10 cm. long, and bears three narrow (2–3 mm. broad), almost erect, dark green leaves. This plant seems to be out of place in the cover of

C. Porteri, and was put there only temporarily. In Giles Co., Virginia, on Bald Knob, alt. 4448 ft., Aug., 1901, H. L. Clark found, and poorly collected, a *Calamagrostis* having the "specific geniculate twisted awn and the foliar tuft of pubescence". But how can we reduce to the umbrophilous pale green *C. Porteri*, confined to wooded slopes and hillsides, this specimen, "de grande lumière", with purplish-bronzed spikelets and growing on a "Bald Knob", at 4448 ft. altitude? Its leaf-blades are 12 cm. long and 4 mm. broad; its panicle goes down to 4.4 cm. long, its spikelet to 3.5 mm. and the lemma to 2.6 mm. long. The plant of New York State is from Sullivan Hill, upper waters of the Susquehanna River, Chemung Co., and was collected by *T. F. Lucy* (no. 11850), July 27, 1895. It resembles Porter's plants in general habit and gross morphology but is strangely different in its spikelet, which has very heteromorph glumes, the lower being 4–4.2 mm. long and the upper only 3–3.5 mm. long; the floret, on the contrary, has a palea as long as the lemma, and often a little longer. These two last and significant characters belong neither to *C. Porteri* nor to *C. perplexa*.

The few collections found in the largest American herbaria under the cover of *C. Porteri*, beside the topotypes, are so different from the type that even a keen botanist could not get through them a true conception of the species. This may have been the case in the publication of *C. insperata* Swallen,[1] collected in Jackson Co., Ohio, less than 300 miles from the type locality of *C. Porteri*, by F. Bartley and L. L. Pontius. Judging by the original diagnosis and by a few spikelets of *C. insperata*, sent to me by Mrs. Agnes Chase, this last species matches *C. Porteri* quite perfectly: culms 85–110 cm. high; longest blade 30 cm. long and 8 mm. wide; panicles 12–14 cm. long; glumes unequal, the longer 5 to 5.5 mm. long; in the few spikelets dissected by me the 1st glume was 5 mm. long and the 2nd 4.2 mm. The awn is strongly twisted and the pattern of callus-hairs thus described by the author "moderately dense, the lateral ones about half as long as the lemma"; anthers about 2 mm. long. All these im-

[1] Journ. Wash. Acad. Sci. 25: no. 9, 413–414. Sept. 15, 1935. TYPE in the U. S. National Herbarium no. 1,611,713. Collected in Ofer (Ophir) Hollow, Liberty Township, Jackson Co., Ohio, Aug. 1, 1934, by *Floyd Bartley* and *Leslie L. Pontius*. A second collection from the same locality bears the data, "Top of dry cliff in Ophir Hollow."

portant characteristics are as if taken from the description already given of *C. Porteri* and indicate not much relation to *C. Pickeringii*, as first believed. This collection from Ohio shows us in what directions the limits of the geographical distribution of *C. Porteri* should be sought.

C. perplexa Scribn., U. S. Dept. Agr., Div. Agrost. Circ. **30:** 7. 1901. Based on *C. nemoralis* Kearney, 1898, not *C. nemoralis* Phil., 1896. Ithaca, N. Y., *Dudley* in 1864.

A brief description of the typical material of *C. perplexa* is necessary to the firm establishment of *C. Lepageana.* The Dudley type was collected at Danby,[1] Tompkins Co., N. Y., Aug. 5, 1884. On the label, we read the following ecological note: "High hill. West Danby . . . in dry woods of Rock Oaks, Hickories, with *Ceanothus, Vacc. stamineum,* etc. Culms scattered. Two tufts of hairs at base of blade of leaf, thus appr. *C. Porteri* Gr. Panicle pale, branches appressed." On a secondary label, W. J. Beal has written: "C. Porteri, florets rather small"; on the sheet, in Kearney's hand there is "*C. nemoralis* n. sp. (T. H. K. jr.)" and in Fernald's "*C. perplexa* Scribn." K. M. Wiegand and R. N. Jones recollected this very rare species in 1917 at Danby, which is near Cornell University; the label gives "dry woods, Thatcher's Pinnacle", no. 7544.[2]

The Danby plant is smaller in all its parts than typical *C. Porteri,* in spite of the misleading description in Hitchcock's Manual of Grasses (1935): "Resembling *C. Porteri,* differing in the somewhat larger, denser panicle." Its scattered culms are 65–104 cm. high, with a panicle 10 cm. long but shortly exserted (4–12 cm.); the spikelet ranges from 3.3 to 4.4 mm. long; the prolongation of the rachilla is much shorter (0.4 mm. long) and thinner than in *C. Porteri* and *C. Lepageana;* the hair on the callus is longer and more abundant than in Porter's grass.

C. **Fernaldii,** n. sp. A *Calamagrosti perplexa* differt in partibus suis vegetativis, quae quadam affinitate cum *C. Pickeringii* gaudent. Planta caespitosa vel subcaespitosa, 20–88 cm. alta;

[1] For more detailed notes on *C. perplexa* from Danby, see Dudley's Cayuga Flora (1886); Rept. N. Y. State Mus. **41:** 58, 1888; U. S. Dept. Agr. Bull. **11:** 26, 1898 and Circ. **30:** 7, 1901.

[2] W. R. Dudley, on the label of his type collection (1884), had a manuscript name which, two years later, in his Flora, he dropped for *C. Porteri.* In 1898, Kearney published his new species *C. nemoralis,* not noticing that Philippi, in 1896, had used *C. nemoralis* for a South American species. Lamson-Scribner, in U. S. Dept. Agr. Circular **30:** 7, 1901, replaced it by the very appropriate *C. perplexa.*

foliis culmi tribus, longis et erectis; *panicula* 6–9 cm. longa. A *Calamagrosti Pickeringii* differt aliunde in *spiculis*, quae contrario similes his *C. perplexae* apparent, cum *glumis* 3–3.7 mm. longis; *lemmate* 3 mm. longo, aristato prope (0.5 mm.) basin, arista 2 mm. longa, in medio geniculata et mediocriter torta; *palea* 2.5 mm. longa; *pilis calli* numerosis, 2–2.5 mm. longis; pilis rachillae paleam aequantibus. MAINE, Piscataquis Co., Boarstone Mt., alt. 1800 ft., Elliottsville, Aug. 16, 1895, *M. L. Fernald*, no. 427 (TYPE in the Gray Herbarium).

The type collection was found in the Gray Herbarium under *C. perplexa.* It is *M. L. Fernald*, no. 427 from Maine. The label was printed *Calamagrostis Porteri* Gray, and on one of the two sheets of this number present in the Gray Herbarium, there is "fide Scribner"; on the sheet, Kearney has written "*C. nemoralis* n. sp." The plant is certainly baffling. Following Kearney's identification, Fernald puts this collection in *C. perplexa*, but always admitting it as not identical. Scribner had assimilated it with *C. Porteri*, undoubtedly as a "pis aller", and before the publication of *C. nemoralis* Kearney. About this plant Wiegand and Eames took a very different position. In their Flora of the Cayuga Lake Basin, they wrote, under *C. perplexa:* "Dry rocky woods, on subneutral sandstone residual soils; very rare. July–Aug. N.w crest and slope of Thatcher Pinnacles, Danby (D. !). Reported elsewhere only from Piscataquis Co., Maine, but an inspection of that plant shows it to be not the same, and more like an offshoot of *C. Pickeringii.* The Danby plant is related to *C. Porteri.*"[1] In general habit the Piscataquis County plant looks like *C. Pickeringii*, var. *debilis*, but inside its spikelets there is the abundance of hairs that characterizes *C. perplexa.* Nevertheless, it cannot be united to the Danby type, which has "scattered culms" and "two tufts of hairs at the base of the leaf"; it is cespitose and has no tufts of hairs at the summit of its sheaths.

In Hitchcock's Manual of Grasses (1935), three other stations are mentioned under *C. perplexa*, the author having merged in that species the not-often-spoken-of var. *lacustris* of *C. Pickeringii*—Minnesota, Fond du Lac, *F. F. Wood*, 1889 (TYPE of var. *lacustris*); Ontario, Lake Nipigon (both mentioned by Kearney in his revision of American *Calamagrostis*, with others around the

[1] Wiegand, K. M. & A. J. Eames, Flora of the Cayuga Lake Basin. Memoir 92: 75. Cornell University, Ithaca, N. Y., 1925.

Great Lakes)[1]. The last locality indicated by Hitchcock was the White Mountains, New Hampshire. In response to one of my letters to Washington on these extra-typical collections of *C. perplexa*, J. R. Swallen, associate botanist at the U. S. Dept. of Agriculture, sent me a few spikelets of a Mt. Washington specimen, apparently the basis of Hitchcock's citation, with a description and a drawing of the plant. Later on, through the courtesy of Dr. W. R. Maxon, I received the plant itself with a manuscript note of Mrs. Agnes Chase identifying the collector's handwriting. It was impossible to see the type of *Calamagrostis breviseta lacustris* Kearney, which is in hiding for the duration of the war. Luckily we have from the Gray Herbarium good collections of *C. Pickeringii*, var. *lacustris*, from the region of the Great Lakes and elsewhere, one (Isle Royale, Mich., *Porter* 1865) cited as typical by Kearney in his original publication which permits clearing up this case also.

The plant of Mount Washington (Lake of the Clouds, New Hampshire, collected by *William Boott*, Sept. 8, 1862) remained for a long time without specific name. On the herbarium sheet I find a label in pencil in the lower left corner on which W. Boott wrote the locality and the date of his collection; a second one, "Ex Herb. Gray", is in Dr. B. L. Robinson's script; a third, "Ex Herb. William Boott", bears in F. T. Hubbard's script *Calamagrostis Pickeringii* Gray; on the sheet A. S. Hitchcock added *C. perplexa* in pencil.

This extraordinary plant of William Boott from Mt. Washington being undoubtedly specifically distinct from all that I had studied before, an eloquent diagnosis in latin was rapidly written down and a new item *Calamagrostis nubila*, "from the clouds", inserted in my key. This addition was sent with great relief to Prof. Fernald, editor of Rhodora, who immediately poured a bit of cold water on my enthusiasm, by pointing out that the type collection of *C. Pickeringii* was equally from Mount Washington and probably from the alpine Lake of the Clouds itself. At first, I must confess, I did not like this news! He advised me, and very wisely, to complete the revision of this small group of *Calamagrostis* with twisted and geniculate awns, by studying all

[1] Kearney, Thomas H., Jr.—A revision of the North American species of Calamagrostis. U. S. Dept. Agr. Bull. 11: 7–42. 1898.

the material present in the Gray and the New England Botanical Club Herbaria of the *C. Pickeringii* complex, type and varieties. And so I did, with great satisfaction finally.

After going attentively over 152 collections of *C. Pickeringii*, or thus identified (that is, some 460 inflorescences and the rest), after noting down many observations on the variability of the vegetative characters of this polymorphous species (Fernald and Wiegand in a note on *C. Pickeringii*, var. *debilis*[1] made a similar remark), especially of the underground stock, of its rhizomal or tufting habits, I am more than ever convinced that it is possible to segregate the specific entities here involved only by taking into account the general habit and by distinguishing between long or short, abundant or scant callus-hair. The disposition of the hairs on the callus—what we may call *their pattern*, a highly constant feature,—seems most satisfactory and should be taken as the primordial character, since it assures us of a better understanding of the group.

The length of the callus-hairs, as everybody knows, is an outstanding trait in the subsection *Orthoatherae* of the genus *Calamagrostis* and so it is among the Ancylatheran species now under consideration. But in this last difficult group, as we just wrote, the clarification of the different specific types cannot be done safely if we do not go further and study the easily separable patterns of pilosity characterizing the extra-floral callus. The quality of the rachillar hairs may be studied later on, if necessary. If we compare the eastern North American species of *Calamagrostis* with geniculate twisted awns, we can readily segregate and distribute them into a continuous series, running from *C. Pickeringii* through *C. lacustris*, *C. Porteri* and *C. perplexa*, *C. purpurascens* and *C. Lepageana*, n. sp., to *C. nubila*, n. sp., of Mt. Washington (PLATE 836, FIGS. 1–4).

The first species, *C. Pickeringii* (FIG. 1), has no hairs on the front of the callus (under the median nerve of the lemma) and only two rudimentary tufts on the sides, occasionally turned in the direction of the rachilla, of very short hairs, 1 mm. long or less, perfectly drawn in Hitchcock's Manual, p. 314, fig. 627.

In a second pattern (FIG. 2) the lateral tufts of hairs are long and strong, reaching ⅔ to ¾ of the lemma, still leaving a gap

[1] Fernald, M. L. & K. M. Wiegand, RHODORA 15: 135–136, 1913.

between them on the frontal callus where there is no hair, as in typical *C. lacustris,* as met on the lowlands of the Great Lakes region and in Newfoundland. The hairless gap is still well marked in *C. Porteri,* the long hairs of the lateral tufts being few. In *C. perplexa,* on the contrary, the frontal gap is much reduced by the spreading of the strong lateral tufts; the same disposition is met ordinarily in the alpine collections classified up to date under *C. Pickeringii,* var. *lacustris* or var. *debilis,* and under *C. perplexa; Fernald* no. 425 belongs to this type (FIG. 2).

In a third pattern of callus-pilosity, the two lateral tufts are present: short in *C. purpurascens,* long in *C. Lepageana,* but uniting the two tufts there is a string of shorter hairs running across the frontal callus (FIG. 3); here again the affinity of these two last species seems apparent.

At the other end of the series, in a fourth pattern, stands quite alone *C. nubila,* having no lateral tufts but a veil of long (3–4 mm.) hairs evenly distributed all around the lemma, the longer reaching the tip of the floret (FIG. 4).

These four patterns of callus-hair should suffice for the time being to solve our immediate problems. Later on, with abundant and representative material, especially in what we call to-day *C. Porteri, C. lacustris, C. perplexa* and *C. nubila,* other patterns of pilosity may fall in line and demand recognition. Experimental taxonomy would find a marvelous field for testing critical species in the genus *Calamagrostis,* especially in the subsection of western and eastern entities with geniculate twisted awn.

C. Pickeringii A. Gray, Man. ed. 2, 547. 1856. White Mountains, N. H., *Pickering* (TYPE in the Gray Herbarium). *C. sylvatica* var. *breviseta* A. Gray, Man. 582, 1848. *Deyeuxia Pickeringii* Vasey, Grasses U. S. 28, 1883. *C. breviseta* Scribn. Mem. Torr. Bot. Club **5:** 41. 1894.

So I come back to the type of *C. Pickeringii,* collected in Sept., 1842, in the White Mountains and originally named on the label *C. sylvatica;* it is a coarse plant, the spikelets examined ranging from 3.8 mm. long to 4.2 mm. On the same herbarium sheet is a second collection from Herb. Oakes with a printed label: *Calamagrostis sylvatica,* L. Var. *breviseta,* Gray, Manual, ed. 1. Alpine Regions, White Mountains, New Hampshire.

Asa Gray has written on it "*C. Pickeringii*, Gray." The first collection, that mentioned in the Manual, is the type. *C. sylvatica* is a very different European species, much nearer to the western American *C. rubescens*, to *C. purpurascens* and to *C. Lepageana* than to the present species, which has very little callus-hair. The alpine regions of Mount Washington have been visited by several botanists who have collected *Calamagrostis* on their way up or at the Lake of the Clouds. Edwin and Charles E. Faxon seem to have specialized on this high mountain and on *C. Pickeringii*. On Sept. 1, 1877, in Oakes Gulf, they collected typical material and var. *debilis*. On Sept. 2, 1877, at Grand Gulf, they collected a plant very heard to classify if we do not look at the callus-hair pattern; on its three labels are written *C. stricta*, *C. neglecta* and *C. Pickeringii*, var. *debilis*. On August 28, 1882, the Faxons are back in Oakes Gulf; on Sept. 4, 1885, they are at the Lake of the Clouds; on August 29, 1890, at the "Head of Oakes Gulf". At the same time, maybe in the company of the Faxons, C. G. Pringle went up "the wet slopes of the White Mts., Aug. 29, 1877", and probably to the Grand Gulf of Mt. Washington on Sept. 2, 1877, where he collected the same critical plant found by the Faxons on the same day! On its label, I find the same uneasy determination three times different: *C. stricta*, *C. Pickeringii* and in pencil "too old,—perhaps referable to *C. neglecta*". The spikelets are in full fruit surrounded by long silky hairs, easier to see since half of the glumes have been disarticulated or torn off by dissecting needles. This shedding of the glumes and the prudent "too old, perhaps" is a sufficient proof of the unorthodoxy of this mutant.

Several other botanists climbed also to Lake of the Clouds, Geo. G. Kennedy (1891), B. L. Robinson (1901), W. W. Eggleston (1901), A. S. Hitchcock (1917), Paul Standley and E. P. Killip (1921), etc., but they collected only *C. Pickeringii*, more or less typical. In some of the Faxon collections (Sept. 1877, 1882 and 1885) from Mt. Washington, the last one exactly from Lake of the Clouds, the lateral tufts of hairs are not so stiff and so reduced as in the type and are more spreading along the lateral nerves of the lemma.

After a careful study of the principal collections made on Mt. Washington, at Lake of the Clouds and nearby, one thing is

absolutely clear, I think: the type of *C. Pickeringii*, with two rudimentary tufts of callus-hairs, and the plant (*W. Boott*, Sept. 8, 1862), chosen as the type of the new species *C. nubila*, with its long hairs evenly distributed on its callus, are two extremes which strikingly differ from all the other species between them. This last species, here described, is phylogenetically important, making the bridge, with its well geniculate twisted awn and its diffuse velum of covering hairs, between the subsections *Orthoatherae* and *Ancylatherae* of the genus *Calamagrostis.*

Kearney in his revision of *Calamagrostis* mentioned few abnormalities; but these are always of genetical interest. Before putting aside the abundant material of *C. Pickeringii* sent to me, we may note the occurrence of a rachilla having hairs only towards the tip, somewhat as in *C. cinnoides.* In one case, the rachilla was transformed into a normal awn; in another, the caryopsis was transformed by smut into a spur. Finally, a viviparous specimen:

C. Pickeringii, forma **vivipara,** n. forma. Spiculis viviparis. Having viviparous spikelets. Nova Scotia: Digby Co., wet savannahs along Little River east of Tiddville, Aug. 22, 1920, *Fernald & Long,* no. 19924 (type in the Gray Herbarium).

Calamagrostis **nubila,** n. sp. (Tab. 836 et fig. 4) Species caespitosa, culmis erectis et validis, 55 cm. longis; *lamina* folii 12–18 cm. longa, 5 mm. lata et, sicut pars exserta culmi et ramorum inflorescentiae, scabra; vagina folii ad os nullo modo pilifera; *panicula* 13 cm. longa, dense florifera, ramulis longioribus et inferioribus flexuosis, 5 cm. longis; *spiculis* valde uniformibus, puberulentibus; gluma I 5.2 mm. longa in nervo medio perscabra, gluma II 5 mm. longa, trinervata; lemmate membranaceo, 4.2 mm. longo, distincte nervato in apice acuminato dentatoque; *palea* 3 mm. longa, hyalina, angusta et ad apicem emarginata; *antheris* 2 mm. longis et 0.3 mm. latis; *arista* 3 mm. longa, lemma subaequante, geniculata et mediocriter torta; *pilis calli* 3–4 mm. longis et numerosis, nascentibus aequali modo circum totam lemmatis basim eamque perfecte velantibus; *pilis rachillae* 2 mm. longis tantum.—Cespitose species, with erect culms 55 cm. high; leaves firm and scabrous, with blades 12–18 cm. long and 5 mm. wide, the ligule 5 mm. long; the summit of the sheath without a tuft of hairs; panicle 13 cm. long, densely flowered, with long spreading flexuous branches, the lower ones 5 cm. long; spikelets remarkably uniform, puberulent, with glumes 5.2 and 5 mm. long, perscabrous on the median nerve; *lemma*, 4.2 mm. long,

membranaceous and distinctly nerved, at the apex acuminate and dentate; *palea* 3 mm. long, hyaline and narrow, emarginate at the tip; anthers 2 mm. long and 0.3 mm. broad; the awn 3 mm. long, equalling the lemma or nearly so, geniculate and weakly twisted; hairs on the callus 3–4 mm. long, very numerous, may be a hundred, and evenly distributed all around the lemma, veiling it to the summit, the hair on the rachilla shorter and 2 mm. long.—New Hampshire: Mount Washington, Lake of the Clouds, *William Boott*, Sept. 8, 1862 (type in U. S. National Herbarium, no. 907166).

With the same general pattern of callus-pilosity—long hairs all around the lemma without distinct lateral tufts—the following collections, perhaps deserving at least a varietal rank, may be placed here until more material is available for study: New Hampshire, Mt. Washington, Grand Gulf, *E. Faxon*, Sept. 2, 1877, and at the same station and the same date *C. G. Pringle*. The four plants of these two sheets, probably collected together, are somewhat starved; culms weak, 30–40 cm. high, with panicles 5–6 cm. long, the spikelets 3.5 to 4 mm. long, their lemma and palea subequal, well surrounded by long stiff hairs, these less numerous than in typical *C. nubila*. The base of the culm is also strongly geniculate here and apparently not in the William Boott plant. Another collection of Edwin Faxon, from Mount Willard, New Hampshire, July, 1875, labeled *C. hyperborea*, *C. stricta* and *C. Pickeringii*, var. *debilis*, has also long hairs on the front and sides of the callus. In some spikelets the hairs seem to form a continuous velum but in some others they seem to represent three tufts: two lateral and one frontal! Kearney, after having cited this collection among the plants he classed in his *C. breviseta*, var. *lacustris*, was forced to admit that it was a bad match with the specimens from Fond du Lac, Minnesota, and from Isle Royale, Michigan. In fact, it cannot go with *C. breviseta* because its *setae* are long; it cannot go with *C. Porteri* or *C. perplexa* because it has well developed hairs on the front of the callus. This Mt. Willard plant is a good match for the *Pease* collections (ncs. 11695, 11696) from Mt. Crawford, New Hampshire, labeled *C. neglecta* by the collector and *C. Pickeringii*, var. *debilis* by G. L. Stebbins. They do not belong to the subsection *Ancylatherae* and are much nearer *C. inexpansa* than anything else. A last number I find in the Gray Herbarium material of *C. Pickeringii* is a very interesting plant with abundant long

white hairs on its callus, found by *Bayard Long and D. H. Linder* on "wet sphagnous swale at border of Beaver Lake, Yarmouth Co., Nova Scotia, July 25, 1920" (no. 19918). In F. T. Hubbard's delicate script we read on the sheet: "Note long callus-hairs". We may note at the same time that the culm is strictly erect, branching from the first, second and fourth nodes from the ground, the three superior nodes bearing three leaves like the sterile shoots; that the awn is perfectly straight and that the very short (2 mm. long) truncate ligule is of a sort found only, with the rest, in *C. neglecta,* that border species of the subsection *Orthoatherae!*

C. lacustris (Kearney) Nash, in Britt. and Brown, Illust. Fl. ed. 2. **1:** 208. 1913. Based on *C. breviseta,* var. *lacustris* Kearney (1898). Fond du Lac, Minn., *Wood,* 1889 (type in the U. S. Nat. Herbarium). *C. Pickeringii,* var. *lacustris* Hitchc. (1906).

In the specimens of *C. Pickeringii* received there is still another lot with lateral tufts of long callus-hairs, the material of the var. *lacustris,* which Hitchcock in his Manual of Grasses has simply transferred, with *Fernald* no. 427, to *C. perplexa.* Thomas H. Kearney in his description of "*C. breviseta lacustris,* var. n. *C. lapponica* A. Gray, Proc. Am. Acad., 6: 78 (1862) in part", writes: "Sometime stoloniferous; rootstock stouter; culms usually taller (5 to 10 dm. high); . . . palea noticeably shorter than the flowering glume . . . : callus hairs more copious, the longer three-fourths to six-sevenths as long as the flowering glume . . . Type specimen in the United States National Herbarium collected at Fond du Lac, Minn., by F. F. Wood, July 23, 1889." Among the "specimens examined," there is a Thos. C. Porter collection from Isle Royale, Michigan, Aug. 2, 1865, which I have here and on the sheet of which Kearney has written *C. breviseta lacustris* n. var. (T. H. K. Jr.). Gray had originally identified this specimen as *Calamagrostis: "Lapponica* L. Manual, Addend., 1868". On a second label, Porter, sticking, as on the label of the type of *C. Porteri,* to a favorite though dubious identification, wrote "*Calamagrostis confinis,* Nutt.—? Perhaps it is a variety of *C. stricta.*" This collection is as defined by Kearney in his diagnosis and is very different from the types of the two species growing on Mt. Washington. Kearney added "The specimens from the region of the Great Lakes are mostly

very distinct, . . . [from] typical *C. breviseta.* Were it not for the occurrence of a few intergrading forms [Mt. Willard plant of *E. Faxon* is one of them] they would be regarded as representing a perfectly distinct species . . . "[1] Since then, several other representative collections have been made at low altitudes: in New Hampshire, Grafton Co., gravelly bank, North Woodstock, valley of the Pemigewasset River, *M. L. Fernald* no. 11542; in the same County at Arethusa Fall, Livermore, *A. S. Pease,* no. 29041, not so typical. NEWFOUNDLAND, along Harry's River, between Bay St. George and Bay of Islands, "Open boggy areas in woods", *M. L. Fernald & K. M. Wiegand,* no. 2545.

UNGAVA; Lac Mistassini, Aug. 10–17, 1943. *Dutilly & Lepage,* no. 11552A, with tufts of long hairs and a distinct gap between; Northern Tesekau Lake, on Marten River, affluent of Rupert River, lat. 51° 10′ and long. w. 76° ?′, rocher granitique. Aug. 1, 1943. *Dutilly & Lepage,* no. 11368. In four other numbers collected last year by Father A. Dutilly and Abbé Ernest Lepage, on Marten River, 11344, 11410, 11432 and 11367A, the vegetative characters and the awn are as in *C. lacustris,* but the type of callus pilosity is dubious.

Now let us turn to *C. Lepageana,* from the Rimouski region, Quebec, Canada, which as we have sufficiently proved, differs from the other eastern North American species. Among the western species only one seems to have some affinity with the Mt. Commis plant to be described: it is *C. rubescens,* the geographical distribution of which, as given in the Hitchcock Manual, is "Open pine woods, prairies and banks, Manitoba to British Columbia, south to northern Colorado and central California. A valuable range grass." The type collection of *C. Lepageana* having been made on a "corniche étroite, au pied d'une muraille du Mt. Commis", I asked Father Lepage to climb to the top, covered with a mixed forest of pine and poplars, of this hill, where more of his *Calamagrostis* should be found. He went and collected, on July 6, 1943, some 169 flowering culms which are to be distributed in the *Plantae Exsiccatae Grayanae,* if numerous enough. The plants of this last collection from the summit of Mt. Commis, in a different habitat, dryer and more exposed to wind and sun,

[1] Kearney, Th. H., Jr. U. S. Dept. Agr. Bull. 11: 25–26. 1898.

have a tendency to form little tufts of culms, to have less exserted panicles and to develop on their glumes a purplish pigment. But the Lepage *Calamagrostis* remains still very distinct from *C. rubescens,* which is now a huge mixture including the types of the additional following species: *C. Cusickii* (Oregon), *C. Suksdorfii* (Washington), *C. aleutica angusta* (Santa Cruz, California), *C. subflexuosa* (Oakland, Calif.), *C. fasciculata* (Mendocino Co., Calif.), *C. Suksdorfii luxurians* (Idaho). A. S. Hitchcock ended his list of synonyms by the remark: "This species has been referred by some American authors to *C. sylvatica* DC., and *Deyeuxia varia* Kunth." To complete the course, we may add that *C. Pickeringii* has also been referred to *C. sylvatica,* which in turn is thrown by European botanists into the synonymy of *C. varia.*

In a preliminary note, addressed to Prof. Fernald last February, I tried to establish the relations existing between *C. Lepageana* and six related species: *C. purpurascens, C. rubescens, C. Cusickii, C. Porteri, C. perplexa* and *C. varia,* mainly by comparing their descriptions in different Floras. Under *C. rubescens,* I wrote: ". . . sheath with pubescent collar (as in *C. Porteri* and in *C. perplexa*); awn short, included or protruding at the side of the glumes, not at their tip (in *C. Lepageana,* the awn protrudes at the tip of the spikelet): callus-hairs scant (now we know the importance of the pilosity-pattern); the culms described as tufted, 60 to 100 cm. tall . . . " "*C. Cusickii* Vasey is a large form of *C. rubescens* with lobed inflorescence . . . . In Hitchcock, Abrams and Rydberg Floras, I find no other near species . . . " Under *C. varia* Host, "This European species is very variable: one specimen, in our herbarium, from Lugano, San Salvador (Flora der Schweiz) VII, 1910, *A. R. Paul* leg., has a spikelet nearer to that of the Mt. Commis plant than to any of the American species studied. But other collections of the European *C. varia* (*C. sylvatica*), from Weissenbach, Tirol, *Trepferi,* from Brandenburg, *O. Weder,* etc., are completely different from the Lepage *Calamagrostis.*"

It is impossible to examine the numerous types included in the complex *C. rubescens,* but by the great size of this "valuable range grass", 60–100 cm. high and more, we can infer that its culms have more than two cauline leaves; the specimens I have

Habit: CALAMAGROSTIS NUBILA
FIGS. 1–4, different patterns of callus-pilosity

CALAMAGROSTIS LEPAGEANA

seen of *C. Suksdorfii*, put by Kearney and Hitchcock in *C. rubescens*, were coarse, fleshy and three-leaved. The drawings in Hitchcock's Manual (fig. 618) of a *C. rubescens* spikelet with the equal glumes, with the lemma not strongly dentate and the palea fairly equal, are not like those of *C. Lepageana*.

Nobody could find, even after a thorough study, great affinity between *C. Pickeringii*, growing generally in tufts and including in its purplish spikelets a very short awn with very small hairs, and *Calamagrostis Lepageana*, from Rimouski County, Quebec, named after Father Ernest Lepage who found the plant.[1] The two species, having different geographical ranges, differ also in organization, as the following parallel will show:

	C. Porteri	C. perplexa	C. Lepageana	C. Pickeringii (typical)
culm	89–130 cm.	65–100 cm.	30–65 cm.	30–60 cm. high
habit	scattered	scattered	scattered	tufting or loosely stoloniferous
cauline leaves	4	4	2	3
mouth of sheaths	pubescent	pubescent	glabrous	glabrous
spikelet	4.5–5.5 mm.	3.3–4.4 mm.	4–4.6 mm.	3.8–4.8 mm. long
color	green	green	mostly green	purplish
panicle	11–22 cm.	9.6–10.5 cm.	6.6–9.2 cm.	6–12 cm. long
exsertion	long	very short	long	short
lemma	4–5 mm.	3.2–3.6 mm.	3–4 mm.	2.8–3 mm. long
awn	3 mm.	2 mm.	5 mm.	2–3 mm. long
hair-pattern	II (scant)	II (abundant)	III	I
rachilla	thick	filiform	capitate	thick
caryopsis	red	red	green	red

As one can see, Porter's, Dudley's and Pickering's Calamagrostis differ greatly morphologically from the Lepage plant, usually 50 cm. high, wiry, its culm being hardly 1 mm. in diameter under the stiff branched panicle. The type collection had scattering rhizomes; but the abundant 1943 material, from the top of Mt. Commis, in different habitat, grew often in little tufts, like *C. Pickeringii* and others. The old sheaths are marcescent and the young shoots have very long (10–20 cm.) and narrow blades, puberulent on their upper face; the leaves of the stem are only two—another character of *C. purpurascens*—one, towards the middle, 7–9 cm. long and only 1–2.5 mm. wide,

[1] The bulk of the type collection, some six sheets, had been sent at first to Washington, where J. R. Swallen recognized immediately the originality of the plant. Just one sheet had been addressed to the University of Montreal and one to the Oka College. Learning that I intended to make a *C. Lepageana* of this plant, Mr. Swallen was good enough to let me have all the material and to work out the problem.

involute at the tip, the other, near the ground, broader but not much longer than the superior one; the ligule, 2 mm. long, is delicate and emarginate. The distribution of the different species, taken in parallel, is geographically on a line going from the Arctic regions to Mt. Commis, to Mt. Washington and the Thatcher Pinnacle, to the more southern Warrior Mts., in the Pennsylvania Blue Ridge. We find *C. Pickeringii* and *C. lacustris* up to Newfoundland, but, so far as I know, they never have been collected in the province of Quebec, at least in the smaller Quebec, excluding the enormous Ungava still lying down like a sphinx before us. Professor Wiegand, a few months before his death, sent me a list of Dr. G. Gardner's collections from Grady Island, Labrador, where I find one number (89) identified as *C. Pickeringii.* This would be the most northern station of this species and the only one in Quebec. But this record must be considered as doubtful; the specimen of Gardner 89 which I received is *C. neglecta.*

To me, the nearest species, morphologically, to the Mt. Commis new type seems to be *C. purpurascens*, which also has two cauline leaves, puberulent on the upper surface; a long awn surpassing the tip of the spikelet and very strong; and, finally, the same dentate-emarginate summit of the lemma with nerves becoming progressively prominent, going up, and the same bidentate hyaline palea. This last and arctic representative of the group with twisted awn had the queer fancy, moreover, to come down and live on the surprising cliffs of Bic, barely ten miles from Rimouski and Mt. Commis. Nevertheless, the following comparison shows that the two species differ sufficiently:

	C. purpurascens	C. Lepageana
spikelet	dark purple	green
length	5–12 mm.	4–4.6 mm.
awn (typical)	6–7.2 mm. long	4–5 mm. long
callus-hairs	III (shorter)	III (longer)
caryopsis	red	olive-green

In the *C. Pickeringii* complex, *C. lacustris, C. perplexa* (sensu Hitchcock) and *C. nubila* may look much like the type, in their general habit; the essential difference between them must be sought in their spikelets, in their geographical distribution and their ecological exigencies. Between *C. Lepageana* and *C. pur-*

purascens the main difference which separates them at first sight is their general habit: arctic xerophyte versus temperate mesophyte. The different stations where *C. Lepageana* was found at Mt. Commis are all calcareous.

From the precious notes furnished by Father Ernest Lepage, the habitat may be properly described. The type locality, Mont-Commis, is in St. Donat, Rimouski Co., 8 miles from the St. Lawrence River, in longitude 68° 11′ 18″ west, latitude 48° 27′ 26″ north, in the Appalache Mt. system, altitude 2600 feet. Mt. Commis by itself is only 500–600 ft. high. The new *Calamagrostis* was found on the north side of this hill, under a perpendicular wall of sandstone and calcareous conglomerates of Silurian age; this fault-escarpment is well marked by the abundant brachyopod *Conchidium Knightii* Sowerby. A mixed forest covers the top of Mt. Commis, but not densely so; in the grass association, rather heliophilous, carpeting this very light forest of the pinus-populus type, *C. Lepageana* grows freely. On the perpendicular wall cling beautifully *Aquilegia canadensis*, *Asplenium viride* and *Woodsia alpina*. Under the escarpment runs a shelf, three feet broad, on which the type of *C. Lepageana.* was found in July 2, 1942, with *Botrychium matricariaefolium*, *Carex eburnea* and *C. concinna*, and undoubtedly fallen from above. Bordering the cornice on the talus below, is a formation of *Salix humilis*, *Acer spicatum* and *Cornus rugosa*, underneath which grow *Polystichum Lonchitis*, *Actaea pachypoda*, *A. rubra* and its var. *neglecta*. The lower part of the slope is covered with *Draba arabisans* and the red *Aquilegia*. Stepping into the forest down Mt. Commis, we meet *Polystichum Braunii*, var. *Purshii*, *Athyrium thelypterioides*, etc.

Calamagrostis **Lepageana,** n. sp. (Tab. 837). Gramen perenne, rhizomatibus (diam. 1.5–2 mm.) satis fragilibus; *culmo* perfecte glabro, 30–65 cm. alto, tenui, diametro vix 1 mm. sub inflorescentia (10–20 cm. longa) exserta; *foliis* annorum praeteritorum ut vaginis marcescentibus praesentibus, novis in pagina superiore puberulentibus subtus et in vagina perglabris, caulinis duobus vel aliquando solis, supremo sub panicula 7–9 cm. longum, 2–4 mm. latum; foliis innovationum sterilium longioribus (10–20 cm.); *ligula* emarginata, 2 mm. longa; *panicula* ellipsoidea, densa, 6.6–9.2 cm. longa, 0.6–1 cm. lata; *spicula* (e medio paniculae), cum *gluma* I uninervia, 4–4.6 mm. longa, 1.4–1.6 mm. lata, *gluma* II trinervia, 3.5–4.2 mm. longa, 1.2–

1.4 mm. lata; *lemmate* 3–4 mm. longo, apice emarginato et valde dentato, nervis in parte superiore paulatim distinctioribus et purpurascentibus; *arista* geniculata et infra torta, 5 mm. longa, inserta prope (0.6 mm.) basim lemmatis, cujus apicem 2–2.5 mm., eum glumae longioris 1.5 mm. superante; *palea* hyalina et bidentata, 2.8–3.6 mm. longa; rachillae prolongatione 1.2–1.5 mm. longa capitata et longe pilosa; *callo* sub dimidio lemmatis piloso, lateribus cristis binis pilorum longiorum (2 mm.) ornato; *anthera* 1.8 mm. longa et 0.2 mm. lata; *caryopsi* viridi, 2 mm. longa.—Quebec: Mont-Commis, near St. Donat, Rimouski Co., alt. ca. 2600 feet, growing on two narrow cornices, in association with *Botrychium matricariaefolium, Carex eburnea* and *C. concinna, Father Ernest Lepage* (no. 3400), July 2, 1942, type in the Gray Herbarium, isotypes sent to the National Herbarium of Canada (3400a), Nat. Herbarium of U. S. A. (3400b), University of Montreal (3400c), Université Laval (3400d), Herbarium of Father Ernest Lepage (3400e) and to the Herbarium of the Oka Institute (3400f).

CONCLUSION

In this rather long study of a difficult group of *Calamagrostis* special attention has been given to the callus-pilosity which permits, with the other data, an easier and a more natural segregation of the species. These callus-hairs may be very long, numerous and evenly distributed around the lemma, as in *C. nubila;* they may be long and in two lateral abundant tufts, as in the umbrophilous *C. Fernaldii* (Sugar Maple-boreal Oak-Tilia forest) and *C. perplexa* (Hickory-Rock Oak-Ceanothus forest); they are short and less abundant in *C. Porteri* (including *C. insperata*). In the circumboreal arctic and surbarctic *C. purpurascens* and in the temperate *C. Lepageana* there is a great reduction of all the callus-hairs, but none are suppressed; between the tufts a string of very short (1 mm. or less) hairs is maintained. In *C. Pickeringii* the frontal callus is glabrous and the lateral tufts are rudimentary, while in *C. lacustris* they are much longer, though still separated by a distinct hairless gap.

The western American species of *Calamagrostis* with twisted and geniculate awns, especially those of the *C. rubescens* complex, should be studied with these patterns of extra-floral pilosity in mind. A. E. Porsild sent me recently some 145 sheets from the National Herbarium of Canada, mostly of western North American species (subsect. *Ancylatherae*). Under one cover of

C. rubescens I found at least two specific types showing different associations of characters and different patterns of callus-pilosity. In *C. Suksdorfii* Scribn. there is the long awn of *C. Lepageana*, but the tip of the lemma is not dentate-emarginate, the callus-hairs are as in *C. Pickeringii* and the mouth of the sheaths is pubescent as in *C. Porteri!* In *C. montanensis* Scribn. the hairs of the callus are abundant, about half as long as the lemma and evenly distributed around the back of the lemma. But all this is another story.

Key to eastern North American Species of Calamagrostis, subsection Ancylatherae

a. Awn longer than the glumes and protruding at the tip of the spikelet; summit of the lemma and palea emarginate-dentate; flowering stems with 1–2 cauline leaves; callus-hairs of pattern III. . . .*b.*

b. Spikelet purple, 5.5–12 mm. long; lemma bearing an awn 5–10 mm. long; caryopsis reddish . . . . 1. *C. purpurascens.*

b. Spikelet mostly green, 4–4.6 mm. long; lemma 3–4 mm. long, bearing an awn 4–5 mm. long; caryopsis olive-green . . . . 2. *C. Lepageana.*

a. Awn shorter than the glumes and sometimes protruding at the side of the spikelet; summit of the lemma and palea more or less truncate-emarginate, but not dentate; flowering stems with 3–4 cauline leaves; callus-pilosity of patterns I, II and IV. . . .*c.*

c. Summit of sheaths glabrous; culms usually tufted and spikelets purplish; cauline leaves 3. . . .*d.*

d. Callus-hairs in two lateral tufts, the front of the callus hairless; awn short, weakly geniculate and twisted. . . .*e.*

e. Callus-hairs scant and short, in rudimentary lateral tufts (pattern I).

Plant coarse; spikelets 3.8–5 mm. long . . . . 3. *C. Pickeringii.*

Plant more delicate; spikelets 2–3.6 mm. long. . . . 3a. var. *debilis.*

e. Callus-hairs abundant and long, in distinct lateral tufts (pattern II).

Coarse plant of low altitude, with long and stout rhizome . . . . 4. *C. lacustris.*

Plant 15–60 cm. high, of mountainous and deciduous forest, on short and tufting rhizome . . . . 5. *C. Fernaldii.*

d. Callus-hairs very long (3–4 mm.) and numerous, forming no lateral tufts, but evenly distributed around the lemma (pattern IV); spikelets 5–5.2 mm. long . . . . 6. *C. nubila.*

c. Summit of sheaths pubescent; culms scattered; spikelet green; callus-hairs with tufts (pattern II); cauline leaves generally 4.

Lateral callus-hairs abundant, 2–3 mm. long; panicle 9–10 cm. long, short-exserted; spikelet 4 mm. long. . 7. *C. perplexa.*

Lateral callus-hairs few; panicle 11–22 cm. long and long-exserted (14–28 cm.); spikelet 5 mm. long . . . . 8. *C. Porteri.*

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A NEW SPECIES OF HOUSTONIA FROM THE CEDAR BARRENS OF LEE COUNTY, VIRGINIA

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In the Cedar Barrens or Glades of Lee County, Virginia, a few miles southwest of Jonesville, a new species of *Houstonia* has been found. Its description is being presented in this paper. Visits to the barrens in course of phytogeographic fieldwork during 1942 have resulted in the discovery of a number of uniquely interesting finds.[1]

The area is an extension of the Great Valley Physiographic Province,[2] merging into the Cumberland Escarpment,[3] revealing conspicuous exposures of upper Ordovician limestone (Stone's River Group) throughout the barrens. Huge cedars compose the dominant tree-growth, and springs rise here and there.

Gattinger's description[4] of the barrens of Tennessee is fitting here for in some measure the two areas parallel each other in geological aspect and richness in floral rarities.

"Where the soil thins out, leaving here and there the rock exposed, or where from the collapse of subterranean cavities the strata are tumbled about in confusion and earth and humus irregularly distributed, there the heavier timber growth gives out, and the cedar is the predominant growth. Its far-searching roots descend into the crevices and cavities of the age-worn rock. The somber tint of the cedar delineates a cedar barren from its surroundings at a distance, and serves within its environs to bring out with dazzling vividness the beautiful green of the glade grass, aglow with rose-colored petalestemons, sky-blue lobelias, golden Leavenworthias, Schoenoliriums and shrubby hypericums. The pink stonecrop, *Sedum pulchellum*, covers acres of surface yielding again to equal profusion of the delicate white Arenaria (*Arenaria patula*), or a low, purple-flowered skullcap (*Scutellaria nervosa*). The *Talinum teretifolium*, span high, with fleshy leaves like a portulaca, the flower resembling the bloom of a phlox, but of the purest carmine, finds room for its tuberous rootlets in the smallest fissures. It will bear transplanting even while flowering, and grows well in the garden. Cream-colored and blue astragals (*Astragalus Plattensis* and *Astragalus caryocarpus*), and a purple, large-flowered, and prostrate psoralea (*Psoralea subacaulis*), phacelias, the blue false indigo (*Baptisia australis*), bluets, and the Carolina anemone (*Houstonia patens, Anemone Caroliniana*), verbenas, violets (especially the pansylike *Viola pedata* var. *bicolor*), the dwarf heliotrope (*Heliotropium tenellum*),

[1] Fuller details are to be found in the writer's doctoral thesis.

[2] Fenneman, Nevin M., Physiography of the Eastern United States. 1938. Plates 2 and 3.

[3] Butts, Charles, Geology of the Appalachian Valley in Virginia. Part 1—Geologic Text and Illustrations. Va. Geological Survey, Bull. 52, 1940. p. 2.

[4] Gattinger, A., The Flora of Tennessee. 1901. Pp. 22–23.

the pale purple *Phlox Stellaria* (which deserves a bed in every garden), and many, many more assemble—a natural conservatory that could fearlessly challenge any flower-garden in the combined effect of gayety and luxuriance. For truth, my honored Tennessee friends, go and see, and learn to appreciate and to preserve such great ornaments of your native land. I cannot dwell longer on this point; suffice it to say that the above are only a few of the most obvious spring flowers, and every succeeding season has its own peculiar growth. The hop tree (*Ptelea trifoliata*), fragrant sumac (*Rhus aromatica*), Carolina buckthorn (*Frangula Caroliniana*), *Forestiera ligustrina*, delightfully fragrant when flowering in July, the Callicarpa, with clusters of rosy flowers and violet berries, and several kinds of hawthorn, are the characteristic shrubs of these barrens. Hackberry, honey locust, winged elm, post oak and shingle oak intermingle in limited numbers with the cedar."

The *Houstonia* has as its associates *Ophioglossum Engelmanni* Prantl, the first recorded for Lee County, *Bouteloua curtipendula* (Michx.) Torr., *Scleria oligantha* Michx., *Agave virginica* L., *Stylophorum diphyllum* (Michx.) Nutt., *Rhamnus caroliniana* Walt., *Opuntia calcicola* Wherry, *Bignonia capreolata* L., *Penstemon calycosus* Small, *Viburnum rufidulum* Raf., *Senecio Millefolium* T. & G. and *Gnaphalium calviceps* Fernald.

A number of these records, which comprise only a partial list, are striking from the standpoint of distribution and rarity, and will be commented on to furnish pictorial impressions with respect to the unique habitat and its flora. Also attention will be given to the endemic or restricted nature of the flora in the Cedar Barrens or Glades of Tennessee. It is interesting to note that both the barrens around Nashville, Tennessee,[1] and those in Lee County, Virginia, lie in the upper Ordovician limestone (Stone's River Group)—thus the expectancy for a correlated type of flora is high. Indeed the Stone's River Group was named from Stone's River in the Nashville Basin of Central Tennessee where the cedar barrens prevail.[2]

Unique types characteristic of the Cedar Glade country of Tennessee are *Lobelia Gattingeri* A. Gray; McVaugh states in his treatment of North American species of *Lobelia*[3] that it is now known only from three counties in the limestone region, barrens and bluffs, of central Tennessee; *Satureja glabella* (Michx.) Briquet according to Svenson[4] apparently confined to limestone

[1] Fenneman, ibid, footnote 2. p. 433.
[2] Butts, ibid, footnote 3. p. 119.
[3] McVaugh, Rogers, RHODORA, 38, 1936. p. 346.
[4] Svenson, H. K., RHODORA, 42, 1940. p. 7.

river bluffs and cedar glades in the vicinity of Nashville, Tennessee; *Petalostemon foliosus* A. Gray, "river banks, Interior Low Plateau, Tennessee to Illinois;" *P. Gattingeri* Heller, "rocky calcareous prairies, cedar glades, and grassy hillsides, Interior Low Plateau, Alabama and Tennessee" according to Small[1]; *Leavenworthia torulosa* A. Gray, "moist cedar glades, Interior Low Plateaus, North Alabama, Tennessee and Kentucky," Small[1]; *Psoralea subacaulis* T. & G., "rocky limestone soil, cedar glades, in the Interior Low Plateau, Tennessee," Small[1]; and *Phacelia Bicknellii* Small, "barren soil, Interior Low Plateaus, Tennessee," Small.[9] The endemic or local nature of the flora of cedar-barren country is evident from these citations, and one has the feeling when exploring in such a habitat that something new is going to turn up. The cedar-glade country of Lee County has never been explored botanically, and the existence of such glades has apparently been unknown to botanists. The area is indeed proving to be a botanical paradise, and as fieldwork proceeds extension of the endemic plants of the barrens of Tennessee into the cedar glades of southwestern Virginia is to be expected.

Of the interesting associates of the endemic *Houstonia*, *Agave virginica* is conspicuous. Search through herbaria reveals that this species has not been collected in Virginia since Clayton first collected it, presumably somewhere in southeastern Virginia, though search there by Fernald and Long has not disclosed its whereabouts. The discovery of *Stylophorum diphyllum*, primarily westward in trend gives us apparently the first record for Virginia. *Penstemon calycosus*, typical of the Interior Lowlands according to Pennell[2], is here reported in Virginia for the first time. *Senecio Millefolium* is now brought into the Gray's Manual range, a rarity which seemingly has not been collected since 1899 and then only in a few localities in the mountains of North Carolina, South Carolina, and Georgia. *Gnaphalium calviceps*, described from southeastern Virginia by Fernald,[3] is present in the cedar glades. Previous to this report it was localized in the former area. It may be seen that one is in an area where the expectancy for new and local things is accentuated.

[1] Small, J. K., Manual of the Southeastern Flora. 1933.

[2] Pennell Francis W. The Scrophulariaceae of Eastern Temperate North America 1935. p. 215.

[3] Fernald, M. L. Rhodora, 37, 1935. pp. 449–50.

Houstonia setiscaphia appears to bring the thought to a reality and is hereby described.

Houstonia **setiscaphia,** sp. nov. Planta cana, ad 1.7 dm. alta; caulis anguli scabrelli, ad caulis basem setis magis evidentibus; folia oblanceolata; inflorescentia compacta; hypanthium setis pellucidis saepius in costis hispidum, calycis lobi setis in costis mediis marginibusque extus hispidi; corolla 4.5–5 mm. longa, ore 2 mm. lato; capsula ca. 2.5 mm. longa.—Virginia: outcroppings of limestone (Stone's River Group) in the Cedar Glades or Barrens, vicinity of Jonesville, Lee County, July 10, 1942, *Lloyd G. Carr*, no. 1110 (type in Herb. Gray.; isotype in Herb. Univ. Penn.).

Houstonia setiscaphia differs from its closest relative, *H. canadensis* Willd. (*H. ciliolata* Torr.) in having its calyx-cup conspicuously adorned with translucent hispid hairs, mostly on the ribs, with the outer face of sepals bearing hispid hairs on midribs and margins. It stands apart from *H. canadensis* also in having angles of stem finely scabrous, the scabrous hairs becoming longer near base of stem. Here it is interesting to note as a contrast that Torrey in his description of *H. ciliolata*[1] points out that the stem is "very smooth on every part." The inflorescence is more densely and compactly flowered. The general aspect of the plant is grayish from the grayish hairs, as opposed to the brownish appearance of *H. canadensis.* The average height of fruiting plants is 6.91 inches, the flowering plant from 4.25 to 5.12 inches while *H. canadensis* is generally much lower, ranging from 2.83 to 6.75 inches according to measurements made from thirteen sheets in the Herbarium of the Academy of Natural Sciences. Both cauline and radical leaves are oblanceolate and not spatulate and ovate as in *H. canadensis.* Late-flowering material shows a corolla-length of 4.5 to 5 mm. with a mouth-spread of around 2 mm., as opposed to a corolla-length ranging from 5.66 to 8 mm. and a mouth-spread ranging from 3 to 4.66 mm. in *H. canadensis.*

I appreciate greatly the assistance of Dr. Francis W. Pennell in drafting the Latin description. I want to thank Professor M. L. Fernald for studying the type-material and verifying the conclusions reached in this paper.

It is a great pleasure to state here that studies were pursued in

[1] Torrey, John. A Flora of the Northern and Middle Sections of the United States. Vol. 1. 1824. pp. 173–4.

completing work for the Ph.D. under the supervision of Dr. John M. Fogg, Jr., during the tenure of Harrison Fellowships in Botany held during the sessions of 1941–42 and 1942–43 at the University of Pennsylvania. Without the contributions made by Mrs. Nellie Carr Brophy, Mrs. Frances Carr Henebry, and Mrs. Mary Carr Butler of Roanoke, Virginia, phases of field work in the southwestern Virginia area would not have been accomplished.

University of Pennsylvania

Two of Rafinesque's Species of Tradescantia.—Dr. Merrill calls to my attention two of Rafinesque's species of *Tradescantia* which seem to deserve a better fate than that accorded them in Anderson & Woodson's *Species of Tradescantia Indigenous in the United States*, Contrib. Arn. Arb. ix. (1935). As a result of study of these two species two names adopted by Anderson & Woodson seem to be clearly antedated by others, one of which should be taken up.

On their p. 75 the monographers maintain *T. canaliculata* Raf. Atl. Journ. i. 150 (1832) for the glabrous species which occurs rather generally through the eastern half of the United States, from Pennsylvania to Minnesota, south to Florida and Texas, and much naturalized farther east. As a synonym they cite *T. ohiensis* Raf. New Flora, ii. 84 (1837—date given by them as 1836[1]), changing the spelling to *Ohioensis.* At the latter date Rafinesque particularly said of his *T. ohiensis:* "described in 1814 from a specimen of Dencke given me by Vanvleck." That should have given a clue, although in 1935 the authors could have found, by consulting Index Kewensis, that *T. ohiensis* was originally published by Rafinesque in his Précis des Découvertes, 45 (1814). For a plant (*T. canaliculata*) of which Anderson & Woodson cite 19 numbers from Ohio, a species essentially glabrous throughout (as compared with the other Ohio species, *T. virginiana,* which the monographers describe as having "sepals . . . uniformly . . . pubescent") the 1814 diagnosis was unequivocal.

[1] Barnhart, quoting letters from Rafinesque to Torrey, shows that the 2nd part did not come out until "1837 (second half)"—See Barnhart, Torreya, vii. 181 (1907).

Tradescantia ohiensis. Feuilles planes, linéaires, aigues, glabres; involucre multiflore plus long que les fleurs, divisions perigonales glabres. —Obs. Dans l'état de l'Ohio dans l'Amér. Sept. fleurs blanches.

There can be no doubt that *Tradescantia ohiensis* Raf. (1814) should displace *T. canaliculata* Raf. (1832).

The second species, *T. discolor* Raf. New Fl. ii. 87 (1837), was reduced without question to *T. virginiana* L. It is noteworthy, however, that *T. discolor* came from Florida and Alabama, whereas Anderson & Woodson recognized *T. virginiana* as following the mountains southward only into northwestern Georgia and eastern Tennessee, and to eastern Missouri. The plant of northwestern Florida and adjacent Alabama with the characters given by Rafinesque for his *T. discolor* (1837) is *T. hirsutiflora* Bush in Trans. Acad. Sci. St. Louis, xiv. 184 (1904), for which the monographers cite 11 numbers studied from Florida and Alabama. Anderson & Woodson describe the latter with "stems erect or ascending, straight . . . , 1.2–4.9 dm. [overlooking their misprint "cm.", which, corrected, equals 5 inches—1 foot, 7½ inches] long, . . . spreading-pilose, or hirsute" (Rafinesque said "Stem strait pilose . . . pedal and bipedal"); "leaves firmly membranaceous, deep green to somewhat subglaucous, . . . linear-lanceolate, . . . scatteringly pilose" (Rafinesque said "leaves lanceolate . . . glaucous and pilose beneath"); "cymes umbellate, . . . ; pedicels . . . pilose, . . . more or less reflexed . . . ; sepals . . . pubescent" (Rafinesque said "umbel terminal . . . , peduncles short nodding pilose like the calyx"). *T. discolor* Raf., however, is invalidated by *T. discolor* L'Héritier (1788). If it belongs in the synonymy of *T. virginiana* so does *T. hirsutiflora*. They may be only a southern extreme of a variable species.— M. L. Fernald.

Juncus acutiflorus rediscovered in America.—In his *Monographie des vrais Joncées*, Mém. Soc. Hist. Nat. Paris. iii. 128 (1827), Laharpe, after stating the European range of *Juncus acutiflorus* Ehrh., said "M. de La Pylaie l'a rapportée dernièrement de Terre-Neuve". In Rhodora, xxviii. 51 and 87 (1926), Professor Fernald emphasized the failure of others to rediscover

in Newfoundland this very distinct plant of central, southern and southwestern Europe.

Two years ago I discovered on Langlade (Little Miquelon) a strange Juncus 3 or 4 feet high, growing in big masses in low open woodland back of the sea. The plant flowered but did not fruit, the summer having been rather cold. I could not find any clue to its identity either in Gray's Manual or in Britton and Brown's Illustrated Flora. I brought it to Harvard University where Professor Fernald was kind enough to identify it for me as the long-lost *J. acutiflorus*. This plant has been found in only one locality. It is now evident that Laharpe's record of LaPylaie's discovery was not an error.—M. LeHors, St. Pierre et Miquelon.

Imagined Wisdom without Understanding.—While I was still a schoolboy, my father, with both wisdom and understanding, employed me to copy longhand a baccalaureate address he was to deliver, with the time-honored text: "Wisdom is the principal thing: therefore get wisdom: and with all thy getting get understanding". I at least got the idea and have subsequently endeavored to pass it on to such students as were susceptible to advice; but it is too often apparent that many people who aim to impart to others what they conceive as wisdom fail to realize the all-important need of understanding. At the moment I have before me one of the most complete assemblages of colloquial or so-called common names of American plants probably ever brought together.[1] This compendium is in the pages of the beautifully printed and seemingly authoritative *Dictionary of American English*[2].

Glancing through the first half of Volume I, "A—Corn patch" (the proper use of hyphens seems to be a stranger to the editors), one can hardly fail to be impressed by the large porportion of space given American names of plants and the fact that someone has done a great amount of compiling, mostly from books of travel or exploration or from fiction or essays, only rarely from accurate botanical writings. All this accumulation, if properly to serve the innocent public, should have been done with real understanding of the matter dealt with; but, apparently, the compilers have been content to compile, without the elementary realization that colloquial names and names loosely used, especially by the uninformed, are very "tricky": that their proper interpretation requires very intimate knowledge of plant-identities and local usages and a clear, instead of a completely muddled understanding. A few years ago Dr. George Neville Jones, reviewing a lexicographer's venture into plant-taxonomy, Criswell's Lewis & Clark: Linguistic Pioneers[3], rightly said: "When the author ventures into the botanical field . . . he loses the trees in the forest . . . Many of his results and conclusions are nothing less than ludicrous", and he concluded with these words which are largely

[1] Of course excepting the authoritative (therefore not much quoted) collection of *Popular American Plant-Names* by Fanny D. Bergen in the Journal of American Folk-lore, vols. v–ix (1892–1896).

[2] *A Dictionary of American English on Historical Principles*, compiled at the University of Chicago under the editorship of Sir William A. Craigie, co-editor of the Oxford English Dictionary, and James R. Hulbert, Professor of English, the University of Chicago. Tne University of Chicago Press. 1938 (Vol. I).

[3] See Rhodora, xliii. 92–94 (1941).

applicable to the *Dictionary of American English*, "It is a pity that the science of systematic botany has to bear the burden of such unripe scholarship".

I have taken the time from more important work to glance over a few of the botanical items under the letters *A* and *B*. These are often completely disheartening. Under **Acacia** the first item is "The North American locust-tree (*Robinia pseudacacia*)", the second "Popularly applied to other species of this genus or to similar plants of other genera", followed by *Gleditsia*, *Gymnocladus* and *Parkinsonia*. Singularly enough, there is no mention of the great genus *Acacia* itself, correctly called by that name in the Southwest, and generally cultivated in northern greenhouses under its correct name.

Under **"Alligator pear"** we read of the avocado "of the southern States", with no intimation that it was introduced there from the Tropics; and surely, in these days at least, the name is not generally applied to the indigenous and more northern tiny- and inedible-fruited Red Bays. In fact, the colloquial term **Bay** proved a little too involved for the nonbotanical compilers of botanical data. The definition, "Any of various trees and shrubs more or less resembling the laurel of southern Europe", is pretty sketchy when we consider that throughout the area of their great development in America the species of *Magnolia*, with showy sepals and petals 2 to 6 inches long, are regularly known as "bay". The resemblance to "the laurel of southern Europe", with tiny and insignificant flowers, is about as striking as that of Poinsettia to Chickweed!

"American yew. The Pacific yew, *Taxus baccata*, var. *Canadensis*" leaves much to be desired, especially as the quotations are from eastern writers who emphasize "a spreading shrub, about 3 or four feet high" or "a prostrate shrub with straggling branches". This is, of course, the common "Ground Hemlock" of the eastern States, eastern Canada and Newfoundland, *Taxus canadensis*. The Pacific Yew, *T. brevifolia*, is a tree up to 75 feet or more high!

Every one who has a flower-garden has "asters", one of the "short and simple annuals of the poor", with great showy heads of flowers, *Callistephus chinensis*. Only the more erudite and rare individual calls them "China Asters"; they are colloquially "Asters". Compilers of a dictionary of American usages, who delight in illiteracies, colloquialisms and slang, such as "acrost", "ain't", "beaut", etc., might have been familiar enough with common usages to have included *Callistephus* in their definition: **"Aster.** One or other plant of the genus *Aster*, having numerous species native to America". Real understanding was, evidently, too much to expect, but, if the author of *Nature's Story* (1884) could be consulted, it is probable that he would admit that he had *Callistephus* in mind when he wrote the passage quoted as illustrative "of the genus *Aster*": "Amy . . . exulted in the extent and variety of their finely quilled and rose-like asters and dahlias".

"Apple" comes in for many compounds: **"Apple borer** . . . , **Apple-boy** . . . A boy who sells apples", followed by **"Apple brandy** . . . A liquor distilled from apple cider". Then, following on through **"Apple-butter", "Apple-cart", "Apple-jack", "Apple-sauce", "Apple-woman** . . . A woman who sells apples", we make the appalling discovery that there is no definition of Apple-cider. How can anyone distill Apple-brandy from Apple-cider if the requisite cider is not officially defined?

There is something perhaps naive in the definition: **"Alder** . . . A tree or shrub of the genus *Alnus;* in America commonly the black alder (q. v.)". Turning to **"Black alder"** we read the correct definition: "A deciduous berry-bearing shrub, *Ilex verticillata*". The *Ilex* is generally "Black Alder"; *Alnus* is almost as invariably "Alder".

One could go on and on but what's the use? One case more, however, should be noted because it so thoroughly displays the lack of understanding, not to say of wisdom, exhibited in these volumes. Two genera of plants are usually known with us as Adder's-tongue: 1st, *Ophioglossum*, fernlike plants, especially the widely distributed, semicosmopolitan *O. vulgatum*, with the sterile portion of the frond dilated, the fertile ending in a spike of sporangia;

2nd, *Erythronium*, Adder's-tongue, Adder's-tongue Lily or Dog's-tooth Violet, a lily with bulbous base, narrow tongue-like and usually mottled leaves, and a drooping bell-shaped yellow, whitish or bluish-tinged flower. Both *Ophioglossum vulgatum* and *Erythronium americanum* (the commonest eastern species) grow in woodlands or meadows. It is, therefore, disconcerting to read under definition 1 in the *Dictionary of American English*, "A species of fern, *Ophioglossum vulgatum;* so called from the shape of the spore-bearing branches" [*O. vulgatum* has a solitary spike], the following extracts supposed by the editors to refer to the *Ophioglossum:* "Adder's-tongue grows two feet high, in running water" [this from Williamson's *History of Maine*, a nonbotanical book replete with misidentifications and misunderstandings; surely *Ophioglossum* is not characteristically of running water in Maine or elsewhere nor two feet high!]; "We brought in our aprons . . . spotted adder's tongues, and dandelions" [just as children still bring in Erythronium and Dandelions in early spring]; "On account of its narrow spotted leaves [*Erythronium*], it is often called 'Adder's Tongue'"; "The spotted adder's tongue, with its waving yellow bells of blossom" [as if *Ophioglossum* is spotted and has "waving yellow bells of blossom". Someone could have been found at the sponsoring institution who would know that ferns and fern-like plants do not have "blossoms"].

These quotations and their sources (writers on local history or of chatty sketches, fiction, poetry and other so-called "literature", almost never careful botanists or those who accurately know plants) and the unintelligent guesses as to what was meant show where one of the troubles lies. Take, for example, Williamson's *History of Maine*, from which the first quotation under *Adder's-tongue* was derived. Williamson was not known as a botanist, but in his *History* he naïvely enumerated the fishes, birds, mammals, plants and other natural life of Maine, naïvely because he made such egregious errors. For instance, the "*cat-tail Flag*" (Typha) identified as "Polypodium", the latter name for many centuries belonging to a group of ferns! Again, quoting from Williamson, "The *eighteenth* and last *kind* of indegenous tree . . . is the *Willow* . . . It is of two species, the *swamp*, or *red*, and the *white*—the former is the first inhabitant of the woods to welcome by its blossoms the return of spring.§", the foot-note identification of this "willow" being "§*Swamp Sumach* (Rhus Toxicodendrum)". The "welcome" given by Swamp Sumach is usually not a welcome one!

"Too much is enough"; but it is a bit puzzling, in view of the admission of such trivialities as **"Apple-woman"**, that many commonly used names of familiar plants are omitted: *Arnica*, a relatively large and showy genus is unmentioned, though the name "Arnica" is in very general use in New England, eastern Canada and Newfoundland for *Leontodon autumnalis*, the Fall Dandelion; Baked-Apple, Bake-Apple or Baked-Apple berry, universally used in eastern Maine, Nova Scotia, Newfoundland, Labrador and elsewhere for the Cloudberry of Scotland, and one of the indispensible fruits of those regions; *Brodiaea*, a large and familiar genus of beautiful western lilies; Beauty-berry (*Callicarpa*), coloring the autumnal woods of the South; and many scores more which a compiler with elementary knowledge of American plants should have caught, including, as typically American from the English editor's viewpoint, "Billion-dollar Grass".

From the emphasis "ON HISTORICAL PRINCIPLES" any one consulting the *Dictionary of American English* has a right to look for the English names used in the earlier, as well as the later enumerations of plants. For instance, Josselyn's *New Englands Rarities* (1672) gives some of the early usages. The book was known to the compilers, for their first quotation under **Bear-berry** (for *Arctostaphylos Uva-ursi*) was taken from it. Unfortunately, the editors or compilers, not understanding simple botanical descriptions, got no illumination from Josselyn's "*Cran Berry*, or *Bear Berry*", which grows in marshes "over-grown with Moss; the tender Branches . . . run out in great length, . . . the Berries, hanging by long small foot stalks, no bigger

than a hair; at first they are of a pale yellow Colour, afterwards red, and as big as a Cherry; some perfectly round, others Oval, all of them hollow, of a sower astringent taste". How any one considered competent to prepare a dictionary can have missed the fact that Josselyn's "*Cran Berry*" and "*Bear Berry*" were, as he said, identical, and were both *Vaccinium macrocarpon*, is almost beyond comprehension. Since, however, Josselyn (1672) was consulted, it is too bad, if the HISTORICAL sequence of usages is so important, that he was so generally ignored (as were many other early writings on American plants). Among the names of plants appearing in Vol. 1 of the *Dictionary* the following, selected from many, may be noted as occurring in Josselyn's *Rarities* and greatly antedating the first American records known to the editors, the dates of which are given, Josselyn's date (1672) being understood: **Cats-tail,** 1791; **Blue flag** (*Iris versicolor* and others), 1784—Josselyn had *Blew Flower-de-luce;* **Adder's-tongue** (*Ophioglossum*), all the *Dictionary's* quotations belonging to *Erythronium,* the earliest from 1832—Josselyn had *Adder's-tongue* and correctly understood it as *Ophioglossum,* a record which, if used, would have partly "saved the faces" of the editors; **Arsmart,** 1784; **Catmint,** 1737; **Clotbur,** 1817; **Cinquefoil,** 1778—Josselyn had *Cinkfoil;* **Avens,** 1784; **Cleavers,** 1781—Josselyn had *Clivers;* **Brake,** 1748, etc., etc.

I have been assured that the *Dictionary of American English* is "the last word" in its fields. It is hoped that, before any more words are published in the field of colloquial names of plants, the editors will add to their staff a thoroughly competent systematic botanist, with human interests as well. The treatment of this exacting field is one which cannot be covered by those whose ignorance of it is so apparent and who do not realize that their "wisdom" needs constant reinforcement from "understanding". It is not creditable to place such lack of understanding before the unsuspecting public as American scholarship; and it is not too much to insist that expensive and seemingly authoritative works of reference should be prepared with at least ordinary intelligence.—M. L. FERNALD.

TWO PLANTS NEWLY INTRODUCED IN EASTERN MASSACHUSETTS.—Neither of the two following species has been reported from the Boston area, nor from the State of Massachusetts either, so far as I have investigated.

ALLIARIA OFFICINALIS Andrz. I discovered this by a shady roadside in Cohasset, Norfolk County, on May 13, 1944, just as it was coming into bloom. There were three small clumps of this interesting biennial. It is an old English garden plant used as a salad herb, according to Fernald and Kinsey. Its chief virtue is that its toothed heartshaped leaves combine the tang of the mustard with a strong odor of garlic. It is therefore called the garlic-mustard, and its name *Alliaria* is derived from *Allium,* the onion or garlic. "Sauce-alone" is an old English name for this plant. It has also been collected at Chester, Conn., by *Mrs. S. G. Smith,* May, 1897, also from Naugatuck by *A. E. Blewitt,* May 18, 1908.

ELSHOLTZIA PATRINI (Lepechin) Garcke. I found this weed close to the sidewalk in an ill-kept dooryard near the Liberty

School at Revere Beach on Oct. 1, 1943. In general appearance, especially as to its leaves, it had a resemblance to *Acalypha*, but I soon discovered its square stem and spikes of pale purple flowers. This Asiatic plant was included in our manuals because it was found by *J. L. Northrop* growing in great abundance in clearings and along the shore of Temiscouata Lake, near Notre Dame du Lac, Quebec. It has since been found in some abundance by Professor *M. L. Fernald*, growing beside the railroad track at New Limerick, Aroostook County, Maine, on Aug. 13, 1909. It was also found, Sept. 10, 1938, spontaneous and freely spreading in a dooryard in Chelsea, Orange County, Vt., by *J. G. Underwood*. Professor Fernald reports it as still flourishing in recent years at Notre Dame du Lac.—Clarence Hinckley Knowlton, Hingham, Mass.

Is there any Evidence of Sericocarpus bifoliatus in the Manual Range?—The hoary-pubescent *Sericocarpus bifoliatus* (Walt.) Porter (*S. tortifolius* Nees), a plant with small obovate leaves, has long been accorded a range northward into Virginia. The Virginia record seems to have started with Torrey & Gray, Fl. ii. 103 (1841), where "Virginia!" begins the stated range; but the paragraph ends with "In a specimen collected in Virginia by Mr. Durand, the lower leaves are sparingly crenate-serrate, and the others entire". Otherwise I find no evidence of the species from north of Pamlico County, North Carolina. I have not located the Durand specimen, which, as shown by the note, was atypical. We need a better voucher from Virginia.—M. L. Fernald.

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The original drawing of DATURA METELOIDES

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TAXONOMIC HISTORY OF PERENNIAL SOUTHWESTERN DATURA METELOIDES

Joseph Ewan

(Plate 838)

The native perennial Southwestern *Datura* variously called the "Sacred Datura" (*Kearney*), "Indian Apple" (*Castetter*) or "Tolguacha" (*Jepson*) carries a botanical name which rests, not upon an actual herbarium specimen, but upon a hastily executed copy of a Sessé and Mociño drawing. This fact in itself need not

concern us unduly since several Mexican plants rest nomenclatorially in like manner upon these drawings which then serve as "types". However, the original description of *Datura meteloides* DC., the current botanical name of this plant, disagrees in several particulars from the living plant, especially in the characters of the flower. Yet this name cannot be shown to be a misapplied binomial because no other species of *Datura* has been found in central Mexico which agrees with the original description[1] nor with the drawing upon which it is based. In short, the drawing which serves as the type in this instance is faulty but still must apparently serve as the nomenclatural basis of the name given by deCandolle. The alternative, which may be desirable, would be to relegate deCandolle's name to the list of *Nomina confusa* and take up the next legitimately published name in the taxonomic history of the plant. This is, beyond question, Eduard Regel's name *Datura Wrightii*, published by Regel upon his recognition of the discrepancy that exists between the original description of *D. meteloides* and the plant introduced into European horticulture in the late 1850's under that name. *Datura Wrightii* rests, although not upon an ascertainable type as designated by Regel, yet upon a thoroughly representative and extant collection which may be designated the lectotype.

This paper aims to bring together the cogent facts relative to this rather intricate nomenclatural situation for a plant well known to Southwestern field botanists, to ethnobotanists[2], to pharmacologists, and to cytogeneticists who must use valid and verifiable binomials in their expanding and important research in *Datura*.

Taxonomic History of Datura meteloides DC.

Our native perennial *Datura* received its first botanical name in manuscript from Alphonse deCandolle in reference to its general resemblance to *D. Metel* L. of India. This name was taken up by Dunal and published in the *Prodromus* in 1852.[3] A close analysis of the original description reveals several points of difference in the flower-morphology over our Southwestern *Datura*. These may be tabulated as follows:

[1] Cf. synopsis by Safford, *Jour. Wash. Acad. Sci.* **11**: 173–189. 1921.

[2] Cf. Safford, *Ann. Rept. Smiths. Inst.* 1920: 550–555. 1922, also, Castetter, *Univ. N. Mex. Bull. biol. ser.* **4**: 26. 1935.

[3] *Prodromus* **13** (pt. 1): 544. 1852.

Datura meteloides As described by deCandolle	Datura meteloides As known from wild plants in the field
Calyx-lobes very unequal	*Calyx-lobes* equal or nearly so
Fruiting calyx deciduous	*Fruiting calyx* persistent
Leaf-blades sinuate to strictly entire, equilateral at base	*Leaf-blades* coarsely sinuate-dentate, usually equilateral at base
Corolla-limb short, scarcely flaring	*Corolla-limb* ample, distinctly trumpet-flaring
Capsule thinly spinose	*Capsule* closely beset with slender subacicular spines

Datura meteloides DC. rests upon a Sessé and Mociño drawing of a plant recorded as native of "calidis Novae Hispaniae regionibus", the frequent designation for central Mexico in the early history of exploration. In verifying the application of the name to the Californian plants of this species I submitted a recent collection (*Ewan 10963*) for comparison with the type in the deCandollean Herbarium. I am indebted to Dr. Baehni and to Dr. Hochreutiner for their assistance in making the comparison and for tabulating the differences for me. The more significant differences have been included in the foregoing table. A photograph of the "type", that is, the drawing (Icones no. 919), taken by Mr. J. F. Macbride, and preserved in the deCandollean Herbarium at Geneva has been kindly furnished by Dr. Clifford C. Gregg of Field Museum, and is reproduced here as Plate 838. Presumably the drawing was prepared from an actual plant-specimen, most likely collected by Mociño. The actual place of collection, in fact the origin of the plant as to its garden-source or other matters, is now unknown. Some suggestions as to the botanizing activities of Sessé and Mociño over the Mesa Central of Mexico have been offered by Sprague.[4] The states of Jalisco and Michoacan especially were visited by them, but the states of Mexico, Morelos, Guerrero, Guanajuato and Queretaro were also visited before 1792.

The unfinished character of the Sessé and Mociño drawing is understandable when the history of these drawings is recalled.[5] It is well known that the originals were loaned to August Pyramus deCandolle by Mociño and recalled on short notice for

[4] *Kew Bull. Misc. Inform.* 1926: 417. 1926.
[5] Cf. Standley, *Contrib. U. S. Nat. Herb.* **23**: 16. 1920.

their return to Spain. Recognizing their value as a documentary record of the Mexican flora, deCandolle enlisted the help of the citizenry of Geneva in making copies of the Mociño drawings before their return. It is a tribute both to deCandolle and to the townspeople who came to his aid that these drawings were preserved to us. But doubtless some of the errors in the *Datura* plate may be attributable to the hurried work of these mostly non-botanical copyists.

Since no collection other than the Sessé and Mociño drawing was cited by deCandolle in the original description, it is impossible to select another collection as a lectotype for *D. meteloides*.

No localized or endemic species of *Datura* from the Mesa Central has been detected with which it might be confused as a misinterpreted name. The Mexican collections seen agree in essential characters with those from our Southwestern states. Except for Regel's name as hereinafter discussed, botanists have quite uniformly accepted deCandolle's name without question; indeed, they have seldom mentioned Eduard Regel's binomial even in synonomy. Safford does not discuss the problem in his interesting and well documented account of the genus *Datura*.[6]

In April, 1855, Thomas Antisell collected what is reported as "Toloachi" between "San Bernardino and San Gabriel" in San Bernardino Valley on the coastal plain of southern California. John Torrey in 1856, in publishing an account of the Antisell collections[7], gave this *Datura* its first varietal name, somewhat falteringly, "*D. Metel* L. var. *quinquecuspida* Torr." This name is nearly without accompanying description; it is a *nomen subnudum*. This fact would indicate that Torrey had not recognized deCandolle's name as applicable to the Californian plant in question.

Taxonomic History of Datura Wrightii Regel

Charles Wright made a good collection, with seeds, of Tolguacha in western Texas in June, 1849 (his no. 526), but since the *Solanaceae* was not reached in the sequence of families treated in *Plantae Wrightianae* (Part I, 1850, published as Smithsonian Contrib. to Knowledge, vol. 3, art. 5), Wright's collection was not noticed prior to the publication of deCandolle's name (1852).

[6] *Jour. Wash. Acad. Sci.*, l. c.
[7] *Pac. RR. Rept. bot. sect.* 7: 18. 1856.

Asa Gray communicated Wright's seeds, however, to the French horticulturist, M. Louis Vilmorin, in 1855 under the name "*Datura meteloides* DC.". Upon its flowering abroad both the Flores des Serres and the Revue Horticole carried illustrated accounts of the novelty in 1857.[8] Especially stressed along with other comparisons were the conspicuous, showy flowers of this new *Datura* over others in cultivation. Vilmorin-Andrieux & Cie. in the third edition (no date) of their *Fleurs de Pleine Terre* give "False Datura Metel" as a French vernacular name but do not comment upon its introduction.

The German botanist Eduard August von Regel (1815–1892) is well known as the founder of the carefully edited horticultural periodical *Gartenflora.* Founded in 1852 this "Monatsschrift" was devoted to German, Russian and Swiss gardens and garden-flowers. It was in July 1859 that Regel published in the *Gartenflora*[9] a description of the *Datura* recently introduced by Vilmorin and now recognized as not conforming with the description of *D. meteloides* DC. Though Regel was at the time Director of the then Imperial Botanic Garden at St. Petersburg, the *Datura* had been grown at Zurich prior to his rather sudden departure for St. Petersburg. Though there are Regel collections made up to the year 1856 at Zurich,[10] there was not preserved a collection of the garden-grown *Datura* which he described in 1859. Many details relative to the description of new species were left unfinished at Zurich, including herbarium-labelling, upon his departure for the directorship at St. Petersburg. In describing *Datura Wrightii* and contrasting it with *Datura meteloides* Regel enumerates the differences as observed in the plants grown at the Botanical Garden at Zurich. He does not refer to the nativity of the Vilmorin seeds beyond the misstatement that the new *Datura* is a native of California. The name is given as "*Datura Wrightii* Hort." but I am unable to locate any previous use of this name before Regel's publication of it in 1859. By inference one must conclude that he knew the seeds were to be credited to Charles Wright, or, possibly, this name may have reached him as a manuscript name when the seeds were received. A search through pertinent seed-lists not available to me now might demonstrate this to be a fact.

[8] The author is indebted to Dr. L. H. Bailey for a photostat of one of these accounts.
[9] *Gartenflora* 8: 193. t. 260. 1859.
[10] Cf. Alphonse deCandolle, *Phytographie* 442. 1880.

In any case, Regel accurately describes and excellently illustrates (t. 260) our Southwestern Tolguacha.

The citation of "Hort." given the binomial by Regel may, I believe safely, be replaced by Regel as author-citation. To be sure, Asa Gray[11], among others, cites the name as Regel published it. More recently *Index Londinensis* assigns the name to Regel. The fact that the author of the binomial himself later[12] accepts the name as of his authorship would clear away possible nomenclatural difficulties on this small point. The fact that the binomial has never been confused under either citation makes the transfer even more accurate.

But the typification of Regel's name is not so simple. Unfortunately Regel apparently did not preserve a specimen of the cultivated plant grown at Zurich. At least Dr. Walo Koch, Docent and Conservator of botanical collections at Eidgenössische Technische Hochschule, informs me[13] that no pertinent collection exists at Zurich. Nor is there a collection at Leningrad which might serve as the type of *D. Wrightii* Regel. There is a single sheet at Leningrad, which Prof. Boris K. Schischkin, Director of the Institute and Botanic Garden, kindly sent me on loan, which might seem to be cogent. It is, however, a collection of *D. Metel* and has been so labelled on the form-label reading "Ex horto bot. Petropolitano". The only data on the label otherwise is as follows: "(1764 m. Ausfeld s[ub]n[omine] D. Wrightii) 18 $\frac{1}{\text{IX}}$ 64. [Ferdinand]v$_{\circ}$ v[on] Herder". Hence this sheet is not involved, I believe, in our problem of establishing the type of Regel's published name. The Charles Wright sheet (his no. 526) from western Texas, as mentioned above, may be satisfactorily designated as the lectotype of *Datura Wrightii*, especially since the seeds which made known the plant in European gardens were also gathered by Wright. Wright's collection came from the head of Turkey Creek at the border of Uvalde and Kinney Cos., Texas, on June 29/30, 1849, en route from San Antonio to El Paso on his first expedition, if the number 526 on the sheet in the U. S. National Herbarium (60043), written on the label in pencil by Asa Gray, refers to the field-collection number.

[11] A. Gray, *Synopt. Fl.* **2** (pt. 1): 240. 1878; ed. 2. 240. 1886.
[12] *Gartenflora* **30**: 218. zinco cut. 1881. Appears as "D. Wrightii Rgl."
[13] Letter of 10 Jan. 1939.

There is the possibility that in this instance, as Wooton[14] pointed out, the "plants were not distributed under the collection numbers." Until further information is at hand, Turkey Creek, Uvalde-Kinney county line, Texas, may be accepted as the type locality of *Datura Wrightii* Regel.

Recommendations

a) I recommend that *Datura meteloides* DC. be accepted as a *nomen emendandum* and continued in use with such corrections made in descriptions as are necessary to bring the concept into accord with the living plant.

b) It is desirable that record of such an emended status be made by citing the binomial as "*D. meteloides* DC. *emend.*"

c) I recommend that "*D. meteloides* DC." be considered by the Committee on Nomenclature of the International Botanical Congress; and if a *nomina conservanda* list for species, apart from that for genera, meets with support from the Congress, that the binomial be proposed for that list to be acted upon at the next regular meeting of the Congress.

d) In the event that *D. meteloides* DC. is relegated to the list of *nomina confusa* by the Congress, I recommend that *Datura Wrightii* Regel be taken up as the next available name for this species.

e) I recommend that *Charles Wright 526* (USNH 60043) be accepted as the lectotype, as designated herein, and that accordingly Turkey Creek, Uvalde-Kinney Co. line, Texas, be taken as the type locality for *D. Wrightii* Regel.

University of Colorado,
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IS ERIGERON CAROLINIANUS A VALID AMERICAN SPECIES?

M. L. Fernald

In his sumptuous Hortus Elthamensis, ii. 412, t. CCCVI, fig. 394 (1732), Dillenius described and illustrated his *Virga aurea carolinensis, Linariae monspessulanae foliis;* and upon this account alone Linnaeus, Sp. Pl. 863 (1753), based his *Erigeron carolinianum,* assumed by Linnaeus from the Dillenian phrase to have its habitat in Carolina. *Erigeron carolinianus* was one of several plants given binomials by Linnaeus, probably without first-hand knowledge of them, and assumed to be American.

Naturally American botanists began guessing what Dillenius might have had. Most of them, unfortunately, did not read what he said. Thus Pursh, Fl. Am. Sept. ii. 535 (1814), placed

[14] Wooton, *Bull. Torrey Bot. Club* 33: 561–566. 1906; cf. also, Geiser, *Field & Lab.* 4: 23–32. 1935, for valuable additions to Wooton's paper.

the yellow-flowered Dillenian plant with flowers all ligulate, the stem "two cubits and more high, and at base as thick as a small finger", in the synonymy of the delicate filiform-stemmed and cespitose *Erigeron hyssopifolius* Michx. (0.5–3 dm. high, with 1 or few terminal heads with central 5-toothed corollas of all *Astereae*, the long ligules lilac-purple to white) which occurs on calcareous rock from Newfoundland to Mackenzie, south to Nova Scotia, New Brunswick, central Maine, northern Vermont, northern New York, Ontario and northern Michigan. By so disposing of *E. carolinianus*, Pursh gave the boreal *E. hyssopifolius* the impossible range: "In low grounds: Canada to Carolina . . . rays yellow." That was a hopelessly bad guess but, really, no worse than those made by later authors; but in order to understand the problem it is necessary to quote the pertinent points in the long Dillenian account (freely translated):

> Stem erect, 2 cubits and more high, as thick as the little finger toward the root, terete, reddish below, striate, clothed from base to summit with crowded very narrow entire leaves, similar to those of *Linaria odorata* J. Bauhin, yet not glabrous but subhirsute; stems toward the summit emitting frequent leafy branches with leaves like the others but smaller, these branches with 1–few flowers (heads); involucre oblong, slender, scaly (6–7 mm. high, 3–4 mm. thick), its ligules ("semi-flosculi") small and yellow (fig. 1) the disk-florets (figs. 2 and 3) not stellately divided, as in other species, but entire at summit, with a ligule at one side; achenes with slender pappus . . . Odor of *Conyza Canadensis* (*E. canadensis*).

Then Dillenius added the significant note that in the greenhouse the plant flowered in late November, the flowers appearing to him to be not natural; in other words, the plant seemed to Dillenius to be a monstrosity[1] (possibly due to aphids or fungi).

Returning to early attempts to place the Dillenian plant, in 1826 Cassini (a famous generic splitter in the *Compositae*), setting up the new genus *Phalacroloma* for *Erigeron annuus* and *strigosus*, said under his *P. obtusifolia* Cass. in Dict. Sci. Nat. xxxix. 405 (1826), *i. e. Erigeron strigosus:* "Nous avons fait cette description spécifique, et celle des caractères génériques, sur un échantillon sec, incomplet et en très-mauvais état, qui se trouve dans l'herbier de M. Desfontaines, où il est etiqueté avec doute *Erigeron carolinianum* ou *hyssopifolium*"—showing how easily

[1] In Hibernaculo Elthamensi floruit anno 1727. Novembris fine, cumque tam fero flores protulerit, dubium mihi visum, num flosculi essent naturales, & an non alia tepidiore tempestate, flosculorum aliorum instar aperirentur, si nempe maturius floreret.

segregate-generá could be proposed long before the so-called "Neo-American" era. Then in 1836, Cassini's American rival at generic splitting, Rafinesque, published the genus *Diplemium* Raf. Fl. Tellur. ii. 50, with four species: *Erigeron carolinianum* L.; *E. nervosum,* the *E. nervosus* Willd., which is *Chrysopsis nervosa* (Willd.) Fernald in Rhodora, xliv. 471 (1942); *Erigeron quercifolius* Lam. and *E. strigosus* Muhl.—the combinations under *Diplemium* not then made. Of these guesses Torrey & Gray, both wise and cautious, wrote: "*E. Carolinianum,* of Linnaeus, is wholly founded on the Virga-aurea Caroliniana, &c. *Dill. Elth. t.* 306, *f.* 394, a yellow-flowered plant, which no botanist has succeeded in identifying. It has nothing in common with the Phalacroloma obtusifolium of Cassini (which is Erigeron strigosum), nor with the Erigeron hyssopifolium, *Michx.* . . . This confusion commenced with Pursh, who erroneously adduced the figure of Dillenius and the E. Carolinianum as synonyms of the E. hyssopifolium of Michaux."—Torr. & Gray, Fl. ii. 180 (1841).

It would have been well if Torrey & Gray's note had finally disposed of the freaky plant which Dillenius himself thought to be abnormal. Asa Gray, in his search of the old specimens preserved at Oxford, found, according to memoranda accumulated by Dr. Stuart K. Harris when he was studying the group, the sheet from which the Dillenian description and plate were made and marked it "Est *Solidago tenuifolia* minus evoluta". Consequently, feeling that the plant belonged there, he gave it in the synonymy of the all-inclusive *S. tenuifolia* Pursh, with the note: "S. tenuifolia, Pursh. This proves to be the *Erigeron Carolinianum,* L., that is, *Virga-aurea Carol.,* &c. Dill. Elth. 412, t. 306, fig. 394."—Gray in Proc. Am. Acad. xvi. 198 (1880). This synonym was, consequently, given in the Synoptical Flora under *S. tenuifolia;* and with alacrity the Committee of the Torrey Botanical Club, without a word of clarification or any supporting citation, rushed it into print as *Solidago* "Caroliniana, (L.) (*S. tenuifolia,* Pursh)" in BSP. Prelim. Cat. 26 (1888). One has to have a good background of bibliographic data to interpret such loosely published stuff! In 1894 Greene, again with complete and most atypical faith in Gray's opinion of 1880, came out with *Euthamia caroliniana* (L.) Greene in Mem. Torr. Bot. Cl. 321 (1894), to displace *Solidago tenuifolia* Pursh and *Euthamia tenuifolia* (Pursh) Nutt.

Now it so happens that the *Solidago tenuifolia* sensu Gray, BSP. and their contemporaries and the *Euthamia tenuifolia* sensu Greene in 1894 consisted of two quite definite species: (1) true *S. tenuifolia* Pursh as to description "foliis . . . obsolete trinervibus"—the plant of New Jersey, extending north into Nova Scotia, New England, etc., and rapidly passing out southward; and (2) *S. minor* (Michx.) Fernald in RHODORA, x. 93 (1908)*S. lanceolata*, β. *minor* Michx. Fl. Bor.-Am. ii. 116 (1803) "in pascuis circa *Charlestown* [South Carolina]," *S. tenuifolia* Pursh, in part, not as to description, and *Euthamia minor* (Michx.) Greene, Pittonia, v. 78 (1902)—*S. minor*, superabundant in the Southeastern States, becoming rare as far north as southern New Jersey. As pointed out by me in 1908 it is "Distinguished from *S. tenuifolia* Pursh, which has flat leaves 2–6 mm. wide and the campanulate involucre 2–3 mm. broad, by its almost acicular leaves (the middle cauline 1–1.5 mm. wide) and its nearly cylindric acute-based involucre only 1–1.5 mm. broad." With two quite distinct and geographically usually isolated species included in Pursh's original *S. tenuifolia* and in the concepts of Gray, Britton and others and of Greene in 1894, the substitution for it of *S. caroliniana* (L.) BSP. or *Euthamia caroliniana* (L.) Greene leaves much in need of clarification, for true *S. tenuifolia* probably does not reach even North Carolina.

Unhappily, however, the name *S. minor* (Michx.) Fernald, used in Gray's Manual, ed. 7 and by Mackenzie in Small's Manual, is antedated by *S. minor* Mill. (1768). Another name for the characteristic southeastern plant has to be found. Of that more later.

In 1902, furthermore, Greene entered the lists. A single southeastern species, *Solidago* or *Euthamia minor* was not enough. He took up *E. tenuifolia* (Pursh) Greene, Pittonia, v. 77 (1902) for the northern species, made the combination *E. minor* for the common southeastern species, described by him as having the stem "corymbosely parted at about the middle into very slender more or less fastigiate branches all copiously . . . floriferous: leaves . . . very narrowly linear, pungently acute, 1-nerved, . . . glabrous throughout, scarcely even the margin scaberulous." But Greene did not stop there; he proceeded to split the southeastern species into the artificial segregates

(photographs of the types secured and presented to the Gray Herbarium by Dr. Harris), *E. microcephala*, from the Carolinas and Georgia, and *E. microphylla* from southern Mississippi. Furthermore, he decided that one number, more loosely branching than most *E. minor* but with broadly corymbose summit, *Tracy*, no. 4748 from Biloxi, Mississippi, was "a most satisfactory herbarium representative of *E. Caroliniana*," Greene then repudiating his and others' misidentification of *Erigeron carolinianus* in characteristically dramatic terms: "In so far as it is connected with a low plant with a corymbose mode of branching that is common both at the North and the South, the above name is misapplied. A critical enquiry into the originals of *Erigeron Carolinianus*, Linn. reveals conclusively the fact that it is a plant exceedingly unlike the *Solidago tenuifolia* of Pursh, with which all authors for eighty years past have blindly agreed in confusing it. Doubtless all that Linnaeus knew about the plant in question he learned from the figure and description that had been published in 1732 by Dillenius. He describes it, evidently from the plate of Dillenius, as an *Erigeron* with panicled stem, solitary heads at the ends of the branchlets . . . It is so exactly a paniculate 'Erigeron' that he places it next to *E. Canadensis*."

When, however, Greene confidently identified the Tracy specimen with the really very different Dillenian plant he overlooked several important differences. In the first place the habit, for Dr. Harris's photograph shows that the *Tracy* specimen which Greene found "a most satisfactory herbarium representative of *E. Caroliniana*", has the fastigiately paniculate-corymbose inflorescence nearly as broad as high and, as Greene admits, "much more broadly [branching] than in the cultivated specimen which Dillenius figured from"—as if cultivation changed a broadly corymbiform inflorescence with many-headed branches several times longer than the subtending leaves into a slenderly virgate-racemiform one with branches shorter than the subtending leaves and the solitary terminal heads greatly enlarged! Another point was overlooked: the Dillenian plate shows the solitary involucres 6–7 mm. high and 3–4 mm. thick; an involucre of *S. minor* (including *Tracy*, no. 4748) more than 4 mm. high and 1.5 mm. thick would be very exceptional. And what of the flowers of the Dillenian plant, all ligulate, the disk-corollas "non stellatim

divisi, ut in aliis speciebus, sed integri in summitate, ab altero latere clausi, ab altero aperti, unde stylus erumpit in duo cornicula longiuscula divisus"? In *S. minor* (including Greene's supposed *Euthamia caroliniana*) the style is included or at most only short-exserted above the regularly 5-toothed limb of the disk-corolla.

Altogether Greene's guess is no better than the others. The sad situation is, that, never having previously looked into the matter, I have been accepting the statements of others (I never learn not to do so) and have distributed many specimens of *Solidago minor* under the inadmissible name *S. caroliniana.* Dr. Harris was evidently misled, as shown in his manuscript discussion of the matter, by accepting as the type of the Dillenian and Linnean species, not the plant described by Dillenius but another specimen in the Dillenian herbarium which is typical *S. minor.* From Dr. Harris's unpublished manuscript I am allowed to copy the following item which explains his interpretation and the labeling of much material as *S. caroliniana*: "In the summer of 1935 Mr. C. A. Weatherby examined the Dillenian material of *Erigeron carolinianum* and found that there were three sheets, two of which could have served as a basis for the plate. His notes show that . . . the heads, while immature, are turbinate and the involucral bracts oblong, abruptly acute and shining but not strongly glutinous. The third sheet was collected by Catesby in South Carolina in 1723 and has the normal inflorescence of the *S. caroliniana* complex, is distinctly glutinous and has the heads 3–4 mm. high. These facts seem to bear out Greene's assertion that *S. caroliniana* is distinct from *S. tenuifolia*". Even though Dillenius had in his herbarium a perfectly normal plant of *S. minor,* collected by Catesby in 1723, that cannot be admitted as the type of *Erigeron carolinianus.* The latter was based exclusively on the description and plate of Dillenius, who did not describe, mention nor illustrate the Catesby specimen. His species rests wholly on the plant raised in the greenhouse, and described or shown to have an elongate-racemose inflorescence of solitary heads twice the size of those of the corymbose specimen of Catesby and with the disk-corollas ligulate and with long-exserted style-branches. We surely cannot take as the type of a well described and clearly illustrated species a specimen which was neither described nor illustrated.

As to the identity of the Dillenian plant and the resultant *Erigeron carolinianus* L., I do not know what it was unless it was something not originally from Carolina or, as Dillenius thought, an abnormal individual. If it were the latter the name cannot stand. It is automatically excluded by Art. 65 of the International Rules: "A name or epithet of a taxonomic group must be rejected when it is based on a monstrosity".

Since the familiar name, *Solidago minor* (Michx.) Fernald is a later homonym another name must be taken up in its place. The bibliography, for which I am chiefly indebted to Dr. Harris, follows:

SOLIDAGO MICROCEPHALA (Greene) Bush in Am. Midl. Nat. v. 176 (1918). *S. lanceolata*, β. *minor* Michx. Fl. Bor.-Am. ii. 116 (1803). *S. tenuifolia* Pursh, Fl. Am. Sept. ii. 540 (1814), in part. *S. caroliniana* BSP. Prelim. Cat. 26 (1888) in part; Harris in RHODORA, xlv. 413 (1943); not *Erigeron carolinianus* L., basonym. *Euthamia caroliniana* Greene in Mem. Torr. Bot. Cl. v. 321 (1894), in part, and Pittonia, v. 76 (1902) as to plant, not *Erigeron carolinianus* L., basonym. *Euthamia minor* (Michx.) Greene, l. c. 78 (1902). *Euthamia microcephala* Greene, l. c. 79 (1902). *Euthamia microphylla* Greene, l. c. (1902). *S. minor* (Michx.) Fernald in RHODORA, x. 93 (1908), not Mill. (1768). *S. microphylla* (Greene) Bush, l. c. 177 (1918). *S. Michauxii* House in N. Y. State Mus. Bull. no. 254: 695 (1924).

Another member of *Solidago*, § *Euthamia* which, unfortunately, must be rechristened is the northernmost variety of *S. graminifolia*, the extreme with relatively broad and bluntish instead of attenuate, leaves which ranges across the continent from Newfoundland and Saguenay Co., Quebec, to Hudson Bay, thence to northern Alberta, south to the Gaspé Peninsula, Quebec, northern Michigan, northern Minnesota, the Black Hills of South Dakota, the Rocky Mts. to northern New Mexico and the valleys of southern British Columbia. Dr. Harris has recently called this most boreal variety *S. graminifolia*, var. *tricostata* (Lunell) Harris in RHODORA, xlv. 413 (1943), based on *Euthamia camporum*, var. *tricostata* Lunell (1911). In doing so Dr. Harris evidently overlooked, as I did in 1913, a very much older varietal name given by Michaux in 1803 to characteristic specimens from Lake St. John, Quebec. This Michaux variety necessitates the combination

S. graminifolia (L.) Salisb., var. **major** (Michx.), comb. nov. *S. lanceolata* L., α. *major* Michx. Fl. Bor.-Am. ii. 116 (1803). *Euthamia camporum* Greene, var. *tricostata* Lunell in Am. Midl. Nat. ii. 59 (1911). *S. camporum* (Greene) Bush, var. *tricostata* (Lunell) Fedde in Just, Bot. Jabresb. xli. Abt. 2: 144 (1913). *S. graminifolia*, var. *septentrionalis* Fernald in Rhodora, xvii. 12 (1915). *Euthamia bracteata* Bush in Am. Mid. Nat. v. 172 (1918). *S. bracteata* Bush, l. c. 173 (1918). *S. graminifolia*, var. *tricostata* (Lunell) Harris in Rhodora, xlv. 413 (1943).

Michaux defined two varieties under *Solidago lanceolata:*

Var. α. *major:* foliis rarioribus, latiuscule linearibus: quae Chrysocoma *graminifolia*. Linn.
— β. *minor:* foliis crebrioribus, anguste linearibus; axillis foliosis: subglutinosa.
Hab. α. in Canada.
— β. in pascuis circa *Charlestown.*

The latter, type of *Solidago minor* (Michx.) Fernald, not Mill., the southeastern species, *S. microcephala* (Greene) Bush, has been sufficiently discussed (see p. 326). The only Canadian material under *S. lanceolata* in the Michaux Herbarium at Paris is a well preserved sheet from Lake St. John, selected by M. Metman as the type of var. α *major*. The sheet has 3 specimens, so like material of var. *tricostata* from James Bay (*Potter*, no. 46), from Red River, Minnesota (*Ballard*, no. 3108) from Leeds, North Dakota (Lunell), isotype of var. *tricostata*, and from the Black Hills (*Rydberg*, no. 770) that I detect no difference. In fact, it would have been most remarkable if Michaux, ascending the Saguenay to Lake St. John, then crossing over to Rupert River and descending that, had not found the characteristic plant of that area. The varietal name used by him is highly inappropriate for one of the smaller variations of *S. graminifolia*. He was contrasting his broad-leaved northern plant with his narrow-leaved southern one.

MENTHA ARVENSIS AND SOME OF ITS NORTH AMERICAN VARIATIONS

Sara R. Stewart[1]

A systematic study of *Mentha arvensis* L. and its varieties, var. *canadensis* (L.) Briquet, var. *lanata* Piper and var. *glabrata* (Bentham) Fernald, in North America resulted in the following observations of this group as a whole. 1. There was no noticeable difference in size, shape or sculpturing of the nutlets. 2. There was considerable variation within the same geographical range in (a) leaf-shape and dentation, (b) degree of hairiness of the stem, (c) length of pedicels, (d) size and lobing of calyx and corolla, (e) spacing of the inflorescences. As the plants proved variable in so many ways, it seemed advisable to return to the diagnostic characteristics used by Linnaeus, Bentham, Briquet, Fernald, and Piper, namely, leaf-shape and degree of hairiness. As there were more than 500 specimens of *Mentha arvensis* or its varieties from Alaska, Canada, Newfoundland and the majority of states of the United States in the Gray Herbarium, no specimens from other herbaria were examined. I wish to acknowledge the patient guidance and help of Professor M. L. Fernald throughout this study.

Key to Varieties

Leaves, in region of inflorescences, ovate to elliptic, with more or less rounded bases . . . . 1. *M. arvensis*, var. *typica*.
Leaves, in region of inflorescences, lanceolate, with more or less cuneate bases . . . . 2. *M. arvensis*, var. *villosa*.

1. Mentha arvensis L., var. **typica**. *M. arvensis* L., Sp. Pl. 577 (1753).

Key to Forms of M. arvensis L., Var. typica

Stem, in region of first-flowering inflorescence, glabrous on sides, minutely pubescent on angles . . . . 1a. f. *glabra*.
Stem, in region of first-flowering inflorescence, pubescent on sides and angles.
Angles of stem more pubescent than sides . . . . 1b. f. *typica*.
Angles and sides of stem more or less equally pubescent.
Hairs 1–3.5 mm. long, spreading . . . . 1c. f. *lanata*.
Hairs 0.2–1.5 mm. long, appressed . . . . 1d. f. *puberula*.

1a. Forma **glabra** (Bentham), stat. nov. Stem, in region of first-flowering inflorescence, glabrous on sides, glabrous (rare) or with hairs rarely longer than 1 mm. on angles; petioles and lower surfaces of leaves glabrous to slightly pubescent. *M.*

[1] Now Mrs. George Metcalf Hinckley.

arvensis L., δ *glabra* Benth., Lab. Gen. Sp. 179 (1833).—Newfoundland: *Fernald, Long & Fogg,* no. 1974; *R. B. Kennedy,* no. 531. Quebec: *Victorin, Germain & Meilleur,* no. 43987; *Fernald & Pease,* no. 25256. Magdalen Islands: *Fernald, Long & St. John,* no. 7982. Maine: Rumford, 1890, *J. C. Parlin.* Massachusetts: Aug. 1, 1908, *Burnham.* New York: Sept. 5, 1909, *Watrous & Burnham.* Pennsylvania: Aug. 20, 1915, *I. W. Anderson.* West Virginia: *Greenman,* no. 243. Ohio: *R. J. Webb,* no. 6. Wisconsin: *Fassett & Wilson,* no. 5518. Illinois: Aug. 1886, *Robinson.* Kansas: *Rev. J. M. Bates,* no. 4594. Washington: *Vasey,* no. 463.

1b. Forma **typica.** Angles of stem, in region of first-flowering inflorescence, always more pubescent than sides, petioles, lower surfaces of leaves, and stem slightly to very pubescent.—Widely distributed, partly naturalized from Europe, partly apparently indigenous, Southern Labrador to Washington, south to Newfoundland, Nova Scotia, New England, Virginia, Kentucky, Nebraska, Colorado and California.

1c. Forma **lanata** (Piper), stat. nov. Stem, in region of first-flowering inflorescence, more or less equally pubescent on angles and sides, hairs 1–3.5 mm. long, spreading; petioles and lower surfaces of leaves more or less densely pubescent. *M. arvensis* L., var. *lanata* Piper, Bull. Torr. Bot. Club **29**: 223 (1902).—Newfoundland: Sept. 15, 1937, *B. W. Brooks.* Quebec: Aug. 4, 1902, *J. R. Churchill.* New Brunswick: *Victorin, Germain & Jacques,* no. 44658. Nova Scotia: *St. John,* no. 1313. Maine: Sept. 1, 1902, *G. G. Kennedy;* July 14, 1909, *Fernald;* Sept. 15, 1904, *O. W. Knight.* New York: June 29, 1910, *Burnham.* Pennsylvania: July 19, 1926, *W. M. Benner.* Ontario: Aug. 20, 1914, *Eames & MacDaniels.* Idaho: 1861, *Dr. Lyall; Sandberg, MacDougal & Heller,* no. 734. California: *Mrs. R. F. Bingham,* no. 8; Aug. 16, 1882, *Pringle;* June 1894, *R. D. Alderson; Abrams,* no. 4069. Washington: *Lake & Hull,* no. 603.

1d. Forma **puberula,** forma nov. Regione primae florigerae inflorescentiae capillis plus minusve aeque ad latera et angulos caulis distributis puberula; capillis 0.2–1.5 mm. longis, adpressis; petiolis paginaque inferiore foliorum puberulentibus.—Pennsylvania: McCall's Ferry, York Co., Oct. 15, 1892, *Heller & Halbach,* no. 641 (type in Gray Herb.). Idaho: Boise, July 27, 1911, *J. A. Clark,* no. 154; ("Oregon") Clearwater, *Rev. Mr. Spalding.* Wyoming: Sybille Creek, Albany Co., July 3, 1900, *A. Nelson,* no. 7383. Utah: Uinta Basin, along irrigation ditch west of Vernal, Uinta Co., Sept. 4, 1931, *Graham,* no. 7416. California: Fort Tejon and vicinity, near lat. 35° & long. 119°, 1857–8, *de Vesey,* no. 76; *Hartweg,* no. 1910; Yosemite Valley, Mariposa Co., Aug. 8, 1891, *Coville & Funston,* no. 1852. Oregon: Trout Creek, base of Stein's Mts., July 18, 1898, *Cusick,* no. 2043.

2. Mentha arvensis L., var. **villosa** (Benth.), comb. nov. *M. canadensis* L. Sp. Pl. 577 (1753). *M. borealis* Michaux, Fl. Bor.-Am. **2**: 2 (1803). *M. arvensis, α. villosa* Benth. Lab. Gen. et Sp. 181 (1833). *M. arvensis* L., var. *canadensis* (L.) Briquet, Bull. Herb. Boiss. **2:** 707 (1894).

Key to Forms of M. arvensis L., Var. villosa

Stem, in region of first-flowering inflorescence, glabrous on sides, minutely pubescent on angles . . . . 2a. f. *glabrata*.
Stem, in region of first-flowering inflorescence, pubescent on sides and angles.
  Angles of stem more pubescent than sides . . . . 2b. f. *typica*.
  Angles and sides of stem more or less equally pubescent.
    Hairs 1–3 mm. long, spreading . . . . 2c. f. *lanigera*.
    Hairs 0.2–1.5 mm. long, appressed . . . . 2d. f. *brevipilosa*.

2a. Forma **glabrata** (Bentham), stat. nov. Stem, in region of first-flowering inflorescence, glabrous on sides, glabrous (rare) or with hairs rarely longer than 1 mm. on angles; petioles and lower surfaces of leaves glabrous to slightly pubescent.—*M. canadensis* L., β. *glabrata* Benth., Lab. Gen. Sp. 181 (1833). *M. arvensis* L., var. *Penardi* Briquet, Bull. Herb. Boiss. **3:** 215 (1895). *M. arvensis* L., var. *glabrata* (Benth.) Fernald, Rhodora **10:** 86 (1908).—Widely ranging from Labrador to British Columbia, south to Magdalen Islands, New Brunswick, New England, Maryland, West Virginia, Ohio, Michigan, Illinois, Missouri, Kansas, New Mexico, Arizona and California.

2b. Forma **typica.** Angles of stem, in region of first-flowering inflorescence, always more pubescent than sides; petioles, lower surfaces of leaves, and stem slightly to very pubescent.—Newfoundland to Alaska, south to Nova Scotia, New England, Virginia, Ohio, Indiana, Illinois, Minnesota, Nebraska, New Mexico and California.

2c. Forma **lanigera,** forma nov. Regione primae florigerae inflorescentiae, capillis plus minusve aeque ad latera et angulos caulis distributis lanosa; capillis 1–3 mm. longis, patentibus; petiolis paginaque inferiore foliorum dense puberulentibus.—Maine: Fort Fairfield, Aroostook Co., July 16, 1902, *Williams, Collins & Fernald;* Fort Fairfield, Aroostook Co., Aug. 10, 1909, *Fernald.* Vermont: Charlotte, Sept. 23, 1879, *Pringle.* Idaho: Valley of N. Fork of Coeur d'Alene Riv., region of Coeur d'Alene Mts., Aug. 14, 1895, *J. B. Leiberg,* no. 1540. California: From Fort Bragg to Glen Blair, Mendocino Co., Aug. 8–16, 1912, *Eastwood,* no. 1666 (type in Gray Herb.). Oregon: Wet sand along Ten Mile L., Lakeside, Coos Co., Aug. 2, 1919, *Peck,* no. 9018. Washington: western Washington, June 1922, *J. M. Grant;* margin of an epsom lake north of Chelan, Chelan Co., June 25, 1931, *Thompson,* no. 6913; Lake Tucker, San Juan Islands, June 25–Aug. 1, 1917, *S. M. & E. B. Zeller,* no. 976.

Alaska: Prince of Wales Island, Klawak Lake, Sept. 12, 1915, *Mr. & Mrs. E. P. Walker*, no. 993.

2d. Forma **brevipilosa**, forma nov. Regione primae florigerae inflorescentiae, capillis plus minusve aeque ad latera et angulos caulis distributis; breviter pilosa; capillis 0.2–1.5 mm. longis, adpressis; petiolis paginaque inferiore foliorum puberulentibus. *M. rubella* Rydberg, Mem. N. Y. Bot. Gard. **1**: 337 (1900).—Saskatchewan: Lake Manitou, along the line of the Grand Trunk Pacific Railway, July 21, 1906, *Macoun & Herriot*, no. 78405; Saskatchewan, 1858, *E. Bourgeau.* Alberta: Castle Hill District, vicinity of Rosedale, July 27, 1915, *M. E. Moodie*, no. 1129; Loc Craigmyle, July 10, 1922, *A. H. Brinkman*, no. 709; Gov. Hay Camp district, Slave River, about 59° 31′ N., 111° 28′ W., Wood Buffalo Park, Mackenzie Basin, Aug. 8, 1928, *Raup*, no. 3163. Montana: Glacier National Park, Teton Co., July 22–28, 1913, *Hunnewell*, no. 2079; *Kirkwood*, no. 2204. Idaho: (Oregon) River side (probably near Lapwai), June 14, *Rev. Mr. Spalding.* Wyoming: Lower Geyser Basin, Yellowstone Park, Aug. 4, 1897, *Rydberg & Bessey*, no. 4900; Jackson's Lake, Aug. 4, 1901, *Merrill & Wilcox*, no. 1133; Fort Steele, Carbon Co., Aug. 19, 1901, *Goodding*, no. 542. Utah: Uinta Basin, east side of Green River, 20 miles south of Vernal, Uinta Co., June 21, 1931, *Graham*, no. 6203. California: Kaweah River Bottom, Tulare Co., July 5, 1904, *Culbertson*, no. 4204; San Joaquin Valley, Porterville, July 31, 1915, *Abrams;* Pine Grove, Amador Co., July 1895, *G. Hansen*, no. 140; Stubbs Flatt, Lake Co., Oct. 20, 1900, *A. Bowman;* Walker's Basin, Sept. 1875, *Rothrock;* Mendocino, Mendocino Co., Aug. 1898, *H. E. Brown*, no. 870; Sacramento Valley about 6 miles northwest of Chico, Butte Co., July 11, 1914, *Heller*, no. 11561 (type in Gray Herb.). Washington: Prosser, Yakima Co., July 11, 1902, *J. S. Cotten*, no. 654; near Wenatchee, Chelan Co., June 24, 1931, *Thompson*, no. 6888. British Columbia: Shawnigan Lake, Vancouver Island, Aug. 7, 1921, *Hunnewell*, no. 7887. Alaska: Nulato, 1916, *J. A. Kusche;* Circle Hot Springs, near Steese Highway about 138 miles north of Fairbanks, July 17–22, 1936, *E. Scamman*, no. 404; Burroughs Bay, Sept. 19, 1915, *Mr. & Mrs. E. P. Walker*, no. 1013.

Mentha arvensis var. *villosa* (var. *canadensis*), confined chiefly to North America, differs from *Mentha arvensis* var. *typica*, found in general throughout the north temperate region of the world, only in its leaf-shape and less extensive range. In some cases, however, the leaf-shape is somewhere between the ovate type with rounded base of *M. arvensis* var. *typica* and the lanceolate type with cuneiform base of *M. arvensis* var. *villosa.* One does not know whether to assign plants with this intermediate type of leaf-shape to var. *typica* or var. *villosa.* The

amount of pubescence on the stems, leaves, petioles and calyces passes through a similar curve of variation, in this case from a glabrate to a short-haired and a long-haired form in both var. *typica* and var. *villosa.* In as polymorphic a species as *M. arvensis* this is not unexpected. I do not, therefore, feel that these extremes of variation merit varietal rank. Such being the case I have reduced former varieties to forms and proposed parallel forms for *M. arvensis* var. *typica* and *M. arvensis* var. *villosa.*

Piper states in his description of *M. arvensis* var. *lanata* that this variety has the size and habit of *M. arvensis* var. *villosa.* An examination of Piper's isotype discloses a plant with the type of leaf-shape which could be determined as either *M. arvensis* var. *typica* or *M. arvensis* var. *villosa,* tending, however, more towards var. *typica.* Of the seven specimens Piper cites, five are represented in the Gray Herbarium, and these I have found to be closer in leaf-shape to var. *typica* than to var. *villosa. M. arvensis* var. *lanata* has, therefore, been reduced to a form of *M. arvensis* var. *typica,* a parallel form being defined for *M. arvensis* var. *villosa.*

The two new forms, *M. arvensis,* var. *typica,* forma *puberula,* Pennsylvania, Idaho, Wyoming, Utah, California, Washington, and *M. arvensis* var. *villosa* forma *brevipilosa,* Saskatchewan, Alberta, Montana, Idaho, Wyoming, Utah, California, Washington, Vancouver Island, Alaska, seem to have a fairly definite geographical range. I do not, however, think they are varieties but rather forms, similar to var. *typica,* f. *lanata* and var. *villosa,* f. *lanigera* but possessing shorter hairs. There are also occasions when it is difficult to separate var. *typica,* f. *lanata* from var. *typica,* f. *puberula* and var. *villosa,* f. *lanigera* from var. *villosa,* f. *brevipilosa.* If more specimens from the Middle West and Middle Atlantic states had been available I believe var. *typica,* f. *puberula* and var. *villosa,* f. *brevipilosa* would be found to have a more extensive range.

M. arvensis L., var. *Pavonia* Briquet (Mexico) and *M. arvensis* L., var. *Schmitzii* Briquet (New Mexico), described by Briquet, Bull. Herb. Boiss. **2:** 708 (1894), were not studied as there were no cited specimens available. *M. arvensis* L., var. *occidentalis* (Rydb.) Jones, *M. occidentalis* Rydberg, Bull. Torr. Club **36:** 687 (1907), was omitted for the same reason.

Alexandria, Virginia.

The Authorship of Scirpus atrovirens.—Traditionally the credit for the original description of *Scirpus atrovirens* is given to Muhlenberg in Descr. Gram. 43–44. 1817. In this publication Muhlenberg himself gives credit for the description of the plant to Willdenow. In the latter's Enum. Pl. (1809) on page 79 is the original description of *Scirpus atrovirens* and Willd. should replace Muhl. where reference is made to the original authorship.—A. A. Beetle, Division of Agronomy, University of California, Davis, Calif.

Modiola caroliniana in Massachusetts.—In April, 1938 our attention was called to a malvaceous plant which had appeared in a recently seeded lawn near the Goodell Library on the Massachusetts State College Campus, and which we identified as *Modiola caroliniana* (L.) G. Don, a plant which normally ranges from Virginia southward into the Tropics. Thinking it to be only a stray, destined to disappear promptly, we gave it no further thought till this year, when it was again called to our attention. We find that it has now become a "foundation planting" extending for several feet along the underpinning of the building and forming a tangle of harsh, wiry branches which root at the nodes and fruit abundantly. Outward from the wall it has adapted itself to the lawn-mower by spreading into a tough mat-weed. Several feet away from it grows a flourishing colony of *Cynodon Dactylon* (L.) Pers., the Bermuda grass which, though reported for Massachusetts, is scarcely a normal part of our flora.

The secret of such aberrant behavior on the part of two southern species is not far to seek. They are growing in soil over the steam pipes. Incidentally they must be highly drought-resistant plants since the soil at this season is dust dry.

This appears to be the first record of *Modiola caroliniana* in Massachusetts and we are happy to deposit a sheet of the plant in the Gray Herbarium.—R. E. Torrey, Massachusetts State College, Amherst.

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CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD UNIVERSITY—NO. CLII

AMERICAN THALICTRA AND THEIR OLD WORLD ALLIES

Bernard Boivin

A world-monograph of this genus was published in 1885 by J. C. Lecoyer in the Bulletin de la Société Royale de Botanique de Belgique (**24:** 78–324. 1885) and reprinted under the title *Monographie du genre Thalictrum.* It contains a history of the genus from Dioscorides to 1885. This need not be repeated here; I will, however, sketch the highlights of the history of our knowledge of the American species.

History of the Genus

Cornut described in 1637 a *Thalictrum canadense,* which, as will be shown later, was not an American species. Morrison in 1715 reported the first three species from the Eastern United States and Canada, but the names he proposed were not validated by later authors and it is not surely known what species he had. He also clearly described a European species, *T. alpinum* L., which was to be first found in America on Newfoundland by Banks in 1766. Again, in 1739, Gronovius in his Flora Virginica proposed two American species and, in the first edition of the Species Plantarum, Linnaeus validated Cornut's species under the name *Thalictrum Cornuti* and described *T. alpinum, T. dioicum* and *T. purpurascens.* Aiton in 1789 described from

cultivated specimens a *Thalictrum rugosum*, purportedly an American species, but Lecoyer (l. c. 311), who saw the type of it along with material cultivated in many botanical gardens, made it a synonym of *Thalictrum glaucum* Desf., a European species. About 1790, Muhlenberg wrote a Flora Lancastriensis which was never published but which contained descriptions of two new species, *T. polygamum* and another species, the first of which was validated in 1825. The manuscript of this flora is at the Gray Herbarium. Michaux (Fl. Bor.-Am. **1:** 322) described *T. laevigatum* in 1803. De Candolle's Systema in 1817 recognized eight species and four varieties for North America, one species for Mexico and four for South America. To these was added *T. peltatum* DC. in the Prodromus, vol. 1, published 7 years later.

From 1824 on there was to be no synoptical treatment of the South and Central American species of *Thalictrum*, though there was a large amount of work done upon the North American species. Hooker in 1829 accepted 4 species in his Flora Boreali-Americana, Torrey & Gray's Flora of North America included 6 species and Sereno Watson listed thirteen species and three varieties in his Bibliographical Index (1878). The same year Lecoyer published a preliminary paper and seven years later in his world-monograph of the genus he attributed twelve species to North America, seven to Central America and three more to South America, in all twenty species and one variety for the Americas. A year later, in 1886, Trelease, working at the time at the Gray Herbarium, published a monograph of the North American *Thalictra*, recognizing twelve species and three varieties.

For the next 25 years the history of this genus was to be dominated by E. L. Greene, who described as new forty-five species and seven varieties of *Thalictrum*. He also left many unpublished names on herbarium sheets in various herbaria. By the time this was over, there existed such a confusion in the taxonomy of this genus that most local floras cautiously followed and still follow more or less the posthumously published treatment by Gray in his Synoptical Flora of North America in 1895, in which thirteen species and four varieties were accepted. J. N. Rose started in 1899 to monograph the Central American and Mexican *Thalictra* but only part of this work was carried through

and published. By the end of 1942, about 165 specific names had been proposed to designate American *Thalictra,* 40 of them for species restricted to areas south of the United States-Mexican boundary.

Value of Descriptive Characters

Height of the Plant. Quite variable in tall species, more constant in smaller ones. *T. rhynchocarpum* Dill. & Rich. of the southern Cameroon Mountains and Fernando Po Island may reach a height of 4 meters.

Pubescence. Extremely useful characters are those based on pubescence; for no matter whether the plant is male or female, whether it is in flower or in fruit, accurate descriptions of the pubescence always apply and can easily be checked no matter how fragmentary the specimen may be. Many normally pubescent species do, however, occasionally present glabrous specimens and mature foliage often loses its pubescence, but the reduced leaves in the upper part of the inflorescence will retain it, at least up to the full maturity of the fruits. Hairs in this genus are either unicellular or multicellular. Furthermore, multicellular hairs may be uniseriate or multiseriate. Unicellular and uniseriate hairs are normally translucent. Capitate hairs are either unicellular or multicellular; all other types are multicellular. Capitate hairs are always very small so that a good binocular may be pretty useful to anybody attempting to identify a *Thalictrum*, but this type of hair usually exudes a fetid and sticky substance *in vivo.* Multiseriate hairs are usually opaque, often whitish and sometimes diversely colored. They may either be stiff, short and blunt or long (1 mm. or more), undulate and attenuate. Short blunt multicellular hairs always render the plant scabrous. In one species, *T. inuncans* nostrum, small hooked prickles are present all over the plant. In another, *T. Standleyi* Steyermark, the hairs are stellate, stipitate, and of a brownish color. This species is also the most fetid of all.

Thus there are six types of hair, all easily recognizable either by the naked eye, the hand-lens or the binocular, e. g.: *capitate hairs, uniseriate flexuous hairs, short multiseriate hairs, long attenuate multiseriate hairs, small prickles* and *stellate hairs.* Within the same species hairs of only one of those types are usually present, or none at all; rarely the same plant will have

hairs of two or three different types. Such a good character has usually been overlooked in the past, thus rendering absolutely impossible the exact interpretation of many a name.

Leaf. An arbitrary distinction has been made between the leaves according to whether they are attached close to or at the base of the stem, whether they are scattered along the lower unbranched half of the stem or whether they subtend a primary branch of the inflorescence. They are respectively termed *folia radicalia, folia caulinaria* and *folia inflorescentiae.*

Leaf-division. Contrary to pubescence, the type and degree of division of the leaf is usually widely variable and was usually stressed by describers of new species. Only rarely does the leaf furnish any specific character, although each species, when well known, may usually be recognized by the contour of the leaflets. But these differences are not constant and not very easily put into words. In most cases leaves vary from 3- to 5-ternate; basal leaves are usually more divided than cauline leaves. Lower branches of the inflorescence are in many species subtended by 1–3-ternate leaves, sometimes by simple reduced ones. Only rarely will the secondary branches of the inflorescence, or even the pedicels, be subtended by leaves, as in *T. sparsiflorum* Turcz. and *T. Hultenii* nostrum.

Petiole and Petiolules. Their length is extremely variable and of little taxonomic value. However, some species, e. g. *T. dioicum* L., are characterized by having the lower branch of the inflorescence subtended by a long-petioled leaf. The base of the petiole is always more or less dilated. Even when the leaf is said to be sessile it is not truly sessile, for this dilated part of the petiole is always present between the stem and the leaf. Not uncommonly this base of the petiole surrounds the stem nearly completely.

Stipules and Stipellules. The dilated base of the petiole is sometimes so much enlarged that its margins may properly be termed stipules. Such stipules are not constantly present nor is their size or contour of any taxonomic value in most American species. Stipellules are always absent in some groups, while in many a species, e. g. *T. Fendleri* Gray, their form and size are inconstant. Stipellules of the first degree are most common but those of the second or third or even the fourth degree may be

encountered. In most North American species stipellules are regularly lacking.

Root. Roots are commonly fibrous, but in a few species they tend to be more or less tuberous, e. g. *T. texanum* (Gray) Small, *T. debile* Buckley and *T. pinnatum* Watson. A few species, e. g. *T. confine* Fern., may have horizontal underground stolons which will at their end produce a stem the following year, for all species of *Thalictrum* are perennial. The general condition is a stem simply thickened at the base, and from that thickened base all the roots depart and there also is produced the bud for the stem of the following year.

Inflorescence. The inflorescence is usually paniculate, sometimes subcorymbose, e. g. *T. polygamum* Muhl. var. *hebecarpum* Fern., or racemose, e. g. *T. alpinum* L. Except for the latter all *Thalictra* have a more or less branched inflorescence but are otherwise simple, there being only one inflorescence to a plant. An exception to this is *T. madrense* Rose which has no definite inflorescence but is branched from the base, with solitary flowers or short panicles at the end of each branch. *T. occidentale* Gray var. *palouense* St. John sometimes has a simple raceme of mostly geminate peduncles. A few species are pauciflorous or uniflorous.

Peduncles. In most species peduncles are quite variable but in a few they will present very constant characters. They are shortest in *T. venulosum* Trel., longest in § Cincineria, arching in *T. alpinum* L., or strongly recurved below the receptacle in *T. sparsiflorum* Turcz., *T. grandifolium* Watson and others.

Perianth. In the subgenus *Lecoyerium* the perianth is typically of 4 sepals. These are usually small and fugacious, more or less oval in contour, and a few millimeters in length; they are of little taxonomic importance. However, in the § *Heterogamia* they are dimorphous, those of the pistillate flowers being much smaller and narrower than those of the staminate flowers. As to their color, they are usually greenish at first, then more or less purplish, and generally withered by the time they drop off.

Sex of Plants and Flowers. All species of *Thalictrum* have perfect flowers except for those of the subgenus *Lecoyerium* in which the flowers may be dioecious, polygamous or perfect, according to the different sections of that subgenus.

Stamens. The color and shape of the filament also characterize the different sections. The exact color of the filament is unknown for many species from Mexico and southward. In some groups the filament is upwardly dilated or clavate, e. g. § *Leucocoma* and § *Physocarpum*. The length of the filament and the anther varies within definite limits for each species; thus it is helpful in identification. The anthers also have a definite shape, from linear to globose, and may be obtuse at the apex or with a more or less well developed acumen. Anthers are usually yellow and give its mass color to the staminate inflorescence. In the § *Leucocoma* the filaments may be responsible for this mass effect. As a rule anthers and sepals will completely hide the ovaries, this being the source of many an erroneous statement on herbarium labels to the effect that the plant is a staminate one when a dissection reveals only or mainly perfect flowers. This error has not infrequently crept into the literature, even in descriptions of new species. Anthers may also be purplish, e. g. *T. polycarpum* S. Watson, or whitish, e. g. *T. clavatum* DC., or even greenish, e. g. *T. hypoglaucum* Rydb. The length of the anther given in the following descriptions is always the length of the anther exclusive of the acumen and immediately after dehiscence, for mature anthers are slightly longer before dehiscence than after, and as they wither and twist, they become still shorter.

Ovary. At flowering time the ovary is generally too small to be characteristic but the stigma varies within definite limits for each species. As the ovary matures into the fruit the stigma usually undergoes a slight elongation, but very often drops off altogether. In quite a number of species there is no sharp demarcation between the style and the stigma. In such cases the length given for the stigma also includes the base of the style.

Fruit. Nearly all species are based mainly on characters drawn from the fruits, for in most species mature fruits vary but little, while, on the other hand, they vary from once species to another. Characteristic features are: shape; length and breadth; thickness; length of stipe; number and design of nerves and ridges; number, direction and pubescence of the fruits; thickness of the fruit-wall.

Nerves of the fruit when raised on ridges often may not be

set off from the ridge itself, but they are usually conspicuous. Nerves are typically eight in number, one dorsal, one ventral, and three on each side. They usually branch off at the base and join at the summit of the fruit; they are then described as being simple. They may run straight from the base or arch over the central cavity or they may be simply curved, as in the case of the lateral nerves of a strongly flattened fruit. Nerves may also be sinuous, undulating, branching or anastomosed.

Relation between Staminate and Pistillate, Flowering and Fruiting Material

This is a problem which is not yet thoroughly worked out and is far from being so. In many species this relation has been established on uncertain grounds, mainly on herbarium specimens bearing two or more fragments representing different phases of, *presumably*, the same species. Sometimes intermediate stages help indicate relation or an unusual specimen will bear both flowers and fruits. Of course, in this problem geographic distribution is not altogether a negligible character. But many species are still known only in fruit or in flower and it is not impossible that the other stage has been collected and is passing under another name.

Interpretation of Descriptions

Most describers, when proposing new species of *Thalictrum*, have emphasized the division of the leaf, the contour, size and figure of the leaflets, the length of petioles and petiolules, all characters of little, if any, diagnostic value; while the type of pubescence, the length of style, filament and anther, the type of nervation and size of the fruit, were too often omitted. This unfortunate neglect renders many a description unintelligible unless one has access to the type-specimen. Consequently an effort was made to study all types that were available in America, for European herbaria are inaccessible for the time being. In so doing I was fortunate enough to have access to nearly all types of *Thalictrum* preserved in America. The United States National Herbarium had stored away a large number of its types but, except in two cases, isotypes were available. Photographs of some 10 types or syntypes along with numerous fragments

and isotypes of species described in Europe have enabled me to understand a fairly large majority of these, while Lecoyer's opinions and discussions greatly helped in interpreting the others. Unfortunately, a few names are still of dubious application and might, when the types are studied, antedate some of the names here accepted.

Terminology of Types

There is much variation as to the use and meaning of the terms applied to typical material. There follow the definitions of those terms needed and used in this paper to characterize such material.[1]

Type: an herbarium specimen upon which the description of a new plant is based. If more than one specimen was used, the type is the specimen designated as such by the describer or by a later student of the group.

Syntype: an herbarium specimen upon which the description of a new plant is based, when there are more than one, and no type has been selected.

Paratype: any specimen, other than the type and the isotypes, upon which the description of a new plant is based. Duplicates of paratypes may be termed paraisotypes, but we have preferred to extend the meaning of paratype to include such specimens in all cases when the homogeneity of the collection was not under suspicion.

Isotype: a duplicate of a type, usually bearing the same collection-number.

The best discussions of type-nomenclature I have found in the literature are: D. L. Frizzell, *Terminology of Types*, Am. Mid. Nat. **14:** 637–668. 1933, and C. X. Furtado, *The Nomenclature of Types*, Gardens' Bull. Straits-Sett., **9:** 285, 308, both with bibliography. Frizzell's paper is written by a zoologist from a zoologist's point of view; it is in the form of a lexicon, with 233 terms, 10 of which he more strongly recommends. The second paper, the author of which is a botanist, proposes and defines 22 terms and 21 compounds with the possibility of a great many more.

[1] Since this study was completed before the clarification of the subject by Blake in Rhodora, 45: 481, 1943, no changes have been made in the text.—Eds.

Such terms as LECTOTYPE, LOGOAPOTYPE, NEOTYPE, PROTOMEROTYPE, and many others have been proposed to express an historical relation between the selection of the type and the date of publication of the new taxonomic group. When it comes to the studying of a species, it is irrelevant whether you work with a HOLOTYPE or a LECTOTYPE. No term expressing an historical relationship has been found necessary in this paper for the proper understanding and concise treatment of a taxonomic problem. Furtado also distinguishes between ISOTYPES and HAPTOTYPES, according to whether they were, or were not, collected from the same plant and at the same time as the type-specimen. Truly this is a very pertinent distinction and in many cases these terms, no doubt, may be useful. But, unfortunately, the average herbarium duplicate bears little or no evidence which might help in making this very important distinction. I have thus felt compelled to use ISOTYPE in a more general sense.

Both Frizzell and Furtado recommend the use of HOLOTYPE for TYPE. This proposal is in accordance with the general use amongst the zoologists and would promote uniformity. But we have not departed in that respect from what seems to be at present the general use amongst botanists. To other terms such as CLASTOTYPE, FOTOTYPE, and others, we have preferred the corresponding English expressions: FRAGMENT OF A TYPE, PHOTOGRAPH OF A TYPE, etc., for reasons of clarity and simplicity.

Keys

Characters in the artificial keys have been selected according to their usefulness, while those used in the general keys to sections and species are either artificial or such as to place related species together. The numbering of species, however, is intended to follow natural relationships whenever possible.

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THALICTRUM

Thalictrum L., Gen. Pl., ed. 5, p. 242, 1754. *Physocarpum* Bercht. & Presl, O Priroz. Rostl. **1:** 14, 1823. nec *Physocarpon* Necker, Elem. **2:** 164, 1790, nec *Physocarpus* Maxim. Acta Horti Petrop. **6:** 219, 1879, nec *Physocarpos* Cambess. Ann. Sc. Nat. **1:** 239 et 385, 1824, nec *Physocarpa* Raf. New Fl. Amer. **3:** 73, 1836. *Ruprechtia* Opiz, Sez. Rost. Kve. 86, 1852, nec *Ruprechtia* C. A. Meyer, Mém. Acad. St-Péters. 6 sér. **4:** 148, 1840, nec *Ruprechtia* Reichb. Nom. 166, 1841. *Leucocoma* (Greene) Nieuwl. Amer. Midl. Nat. **3:** 254, 1914, nec *Leucocoma* Rydb. Fl. Rock. Mts. 108, 1917. *Sumnera* Nieuwl. Amer. Midl. Nat. **3:** 254, 1914. *Plantae* perennes, *caule* annuo herbaceo vel suffruticoso plus minusve sulcato, *caudice* perenni, vel interdum stoloniferae. *Radices* numerosae fibrosae, interdum tuberosae. *Folia* alterna, vel raro subopposita, vel opposita etiam, plerumque ternata et amplius composita. Floralia saepius desunt. *Inflorescentia* paniculata saepius racemosa vel subcorymbosa, nuda vel parum foliosa, *ramis pedicellisque* alternis vel subaggregatis. *Petioli* basi dilatati, saepius vel amplexicaules vel subamplexicaules, plus minusve dilatati duarum modo stipularum vel nonnunquam etiam stipulati et interdum stipellulati quoque. *Flores* numerosi, perfecti vel dioici vel polygami. *Calyx sepalis* hinc quatuor illinc quinque nonnunquam sex vel septem, fugax, viridis vel frequentius petaloideus.

Corolla deest. *Stamina* libera plura vel numerosa, sepala fere semper per anthesim excedentia, numero variabili. *Antherae* adnatae comissura filamentis basilari nec articulatae. *Ovaria* unilocularia soluta, numero in diversis diverso et variabili, *semine* solitari apicali inverso. *Stylus* elongatus, *stigma* vel similiter elongatum vel triangulare vel punctatum ferens per longitudinem fere totam. *Carpella* pauca vel numerosa, uniseminata indehiscentia, sicca nervosa, plus minusve inflata, nonnunquam stipitata, frequenter costata. Species typica: *Thalictrum foetidum* L. ut imprimis Britton & Brown proposuerunt in Ill. Fl. **2:** 118. 1913.

The proposed standard species of the Linnaean generic names published in the International Rules of Botanical Nomenclature, p. 142, 1935, suggested that *T. aquilegifolium* L. should be taken as a type-species; but, in view of the fact that the latter species has been many times separated from *Thalictrum* to form a separate monospecific genus, it seems preferable to adhere to the older proposal. And, after all, *T. foetidum* L. is much more characteristic of the genus as a whole than is *T. aquilegifolium* L.

Subdivisions of the Genus

Two genera, *Anemonella* and *Trautvetteria* have been separated from *Thalictrum* and are usually accepted as distinct genera. Many more generic segregations have been proposed at one time or other but are not here considered worth recognition. Those synonyms are listed under the subdivisions which were thus raised to a generic rank.

De Candolle in his Systema (vol. **1**, 1817) proposed five sections and four more subdivisions; Lecoyer (Bull. Soc. Bot. Belg. **24:** 111–113, 1885) was the first to recognize the fact that a natural classification of the genus sets the American species apart from the Eurasian ones but, unfortunately, the names he gave to his sections and subsections were not in Latin; Prantl (Nat. Pfl. **3**, 2: 66) in 1888 proposed nine new subdivisions for the genus but he grouped the species in such a way that it is impossible to ascribe to each of his new names a definite position in the scheme actually adopted in this paper; E. L. Greene (Leaflets, **2:** 49) in 1910 proposed the family *Thalictraceae* to include *Thalictrum, Anemone, Coptis, Aquilegia* and *Anemonella;* and in 1914 Nieuwland proposed to recognize *Sumnera* and *Leucocoma* as distinct genera.

KEY TO THE SUBDIVISIONS OF THE GENUS

a. Flores perfecti; stigma sub anthesim a sepalis persaepius quinis recedens........................Subgenus THALICTRUM....*b*.
  b. Stigma bialatum deltoideum ventrale sessile. Filamenta filiformia et saepius ad junctionem cum antheris paullulum incrassata. Carpella matura costata sessilia....*c*.
    c. Carpella matura haud compressa..........Sectio HOMOTHALICTRUM.
    c. Carpella matura compressa......................Sectio GENUINA.
  b. Stigma haud alatum nec sagittatum vel, si anguste alatum, lineare....*d*.
    d. Filamenta filiformia et saepius ad junctionem cum antheris paullulum incrassata. Stigma nonnumquam circinatum. Carpella matura nunquam costata, nervis tamen valde rugosis, saepius breviter stipitata Sectio LEPTOSTIGMA.
    d. Filamenta staminum plus minusve clavata, ad junctionem cum antheris paullulum constricta, alba vel rufescentia, raro purpurascentia; variant antherae globosae usque ad oblongo-lanceolatas; stigma nunquam alatum nec sagittatum nec circinatum....*e*.
      e. Fructus inflatus vel compressus, apterus....*f*.
        f. Fructus costatus sessilis vel subsessilis nec compressus sed nervis singulis saepius in costas elevatis. Stigma ventrale.....................Sectio ERYTHRANDRA.
        f. Fructus stipitatus plus minusve compressus nec costatus, nervis tamen rugosis....*g*.
          g. Fructus plus minusve compressus nervo dorsali convexiore vel curvato ad modum ventralis; stigma ventrale vel apicale; pedicelli recti; folia caulinaria saepius desunt........Sectio PHYSOCARPUM.
          g. Fructus valde compressus nervo ventrali convexiore; folia caulinaria adsunt et 3–5-ternata sunt; stigma cylindraceum............Sectio OMALOPHYSA.
      e. Fructus valde tri-quadrialatus stipite longissimo; stigma ventrale.........................Sectio TRIPETRIUM.
a. Flores dioici vel polygami, raro perfecti, stylus sub anthesim sepala quaterna excedens...................Subgenus LECOYERIUM.
  h. Flores polygamo-monoici, licet perfecti, stigma filiforme elongatum, saepius cylindraceum, rarissime anguste bialatum. Sepala haud dimorpha....*i*.
    i. Ovaria pauca, solitaria, vel gemina, licet raro 3–4. Pedicelli longissimi tempore fructuum maturitatis. Flores perfecti.................................Sectio CINCINNERIA.
    i. Ovaria numerosa. Pedicelli ad 6 cm. longi. Flores polygamo-monoici, raro perfecti. Stigma, nisi in *T. Johnstonii*, cylindraceum....*j*.
      j. Foliolae haud peltatae.............Sectio CAMPTOGASTRUM....*k*.
        k. Ovaria 10 vel pauciora. Carpella matura compressa....*l*.
          l. Carpella nervo ventrali nullo modo gibboso. Subsectio SIMPLICIA.
          l. Carpella nervo ventrali gibboso...........Subsectio GIBBOSA.
        k. Ovaria 18–36. Carpella matura ventre globoso. Stigma paullulum clavatum..........Subsectio VENTURIANA.
      j. Foliolae peltatae.......................Sectio PELTERIA....*m*.
        m. Foliolae minores petiolis prope marginem insertis. Subsectio SUBPELTATA.
        m. Foliolae ampliores petiolis circa tertias insertis. Subsectio EUPELTATA.

h. Flores dioici vel polygamo-dioici, stigma breve plus minusve bialatum. Sepala dimorpha, floris foeminei minora. . . .*n.*

n. Filamenta colorata filiformia, flores dioici, rarissime polygami. Foliola apice trilobata, lobis persaepius crenatis. . . . . .Sectio HETEROGAMIA. . . .*o.*

o. Carpella recta ventre symmetrico, nervis crassiusculis, nec compressa nec curvata. Radices fibrosae vel tuberosae, nec stoloniferae. Plantae glabrae. . . .*p.*

p. Radices tuberosae. . . .*q.*

q. Carpella nervis simplicibus nec sinuosis sed rectis. Folia ternatisecta. . . . . .Subsectio DEBILIA.

q. Carpella nervis sinuosis. . . . . .Subsectio SINUOSA.

p. Radices fibrosae. Petioluli articulati. Nervi carpellorum haud sinuosi. . . . . .Subsectio DIOICA.

o. Carpella curvata vel compressa. Plantae nonnunquam pubescentes, plus minusve stoloniferae. . . .*r.*

r. Carpella pariete crasso et firmo, incurvata, haud compressa, costata, nervis haud distinctis a costis, nervo dorsali convexiore quam ventrali Subsectio INCURVATA.

r. Carpella plus minusve compressa, recta, vel basi plus minusve recurvata, vel valde compressa, nervis conspicuis, pariete nonnunquam membranaceo. . . .*s.*

s. Carpella parum compressa, recta et conspicue stipitata, nervo ventrali convexiore quam dorsali. . . . . .Subsectio CLAVOCARPA.

s. Carpella subsessilia vel, si stipitata, stipite recurvato vel nervo ventrali convexiore quam dorsali, vel valde compressa. . . .*t.*

t. Crassitudo carpelli dimidiam latitudinis partem vel attingit vel superat. . . . . .Subsectio COMPRESSA.

t. Crassitudo carpelli a dimidiis latitudinis recedit Subsectio LAMINARIA.

n. Filamenta alba saepius plus minusve clavata, flores polygamo-dioici. Foliola integra, vel, si apice trilobata, lobis integris. . . . . .Sectio LEUCOCOMA.

The following treatment takes into account all species attributed to America, plus, when a subdivision of the group is not confined to America, a brief world-treatment of that subdivision. However, the § GENUINA is not fully treated, for only two, or perhaps three, of its numerous members have been collected in America. To add a full treatment of this section to this paper would have transformed it into a world-monograph, a study not possible under the present conditions. Similarly § OMALOPHYSA is incompletely treated for lack of sufficient herbarium material.

Subgenus THALICTRUM (DC.) Reich. Sect. *Euthalictrum* DC. Prod. **1:** 12, 1824. Sect. *Thalictrum* DC. Syst. **1:** 172, 1817. Subg. *Thalictrum* (DC.) Reich. Consp. Regn. Veg. 192, 1828. *Plantae radicibus* persaepius fibrosis, *caule* plus minusve foliosa, *foliis* stipellulatis vel estipellulatis. *Inflorescentia* ampla, saepius paniculata, raro subcorymbosa vel racemosa. *Flores* perfecti.

Sepala saepius 5 in flore. *Stigmata* in anthesi a sepalis recedentia. Species typica *Thalictrum foetidum* L. sit.

Sectio **Homothalictrum.** *Homothalictrum* Fries, Sum. Veg. Scan. 27, 1846, nomen nudum. Sect. *Camptogastrum* f. *Flexuosa* Prantl, Nat. Pfl., **3:** 2: 66, 1888.—*Filamenta* filiformia nonnunquam purpurascentia. *Stigma* bialatum deltoideum ventrale sessile. Carpella matura costata sessilia nec compressa. Species typica sectionis *T. minus* L. sit.

As created by Fries, his genus *Homothalictrum* included only *T. alpinum* L.; and I was also at first under the impression that the simple raceme was a character sufficient by itself to set off this species from the rest of the genus. But this character must be considered rather as an extreme, especially if one compares this species with its nearest relatives, *T. Esquirolii* Lévl. & Vant. and *T. isopyroides* Meyer. Amongst the species to be referred here besides *T. minus* L., there are: *T. alpinum* L., *T. angustifolium* Jacq., *T. Esquirolii* H. Lévl. & Vant., *T. flavum* L., *T. galioides* Nestl., *T. isopyroides* Meyer, *T. kemense* Fries, *T. punduanum* Wall., *T. rugosum* Ait., *T. simplex* L., *T. squarrosum* Steph.

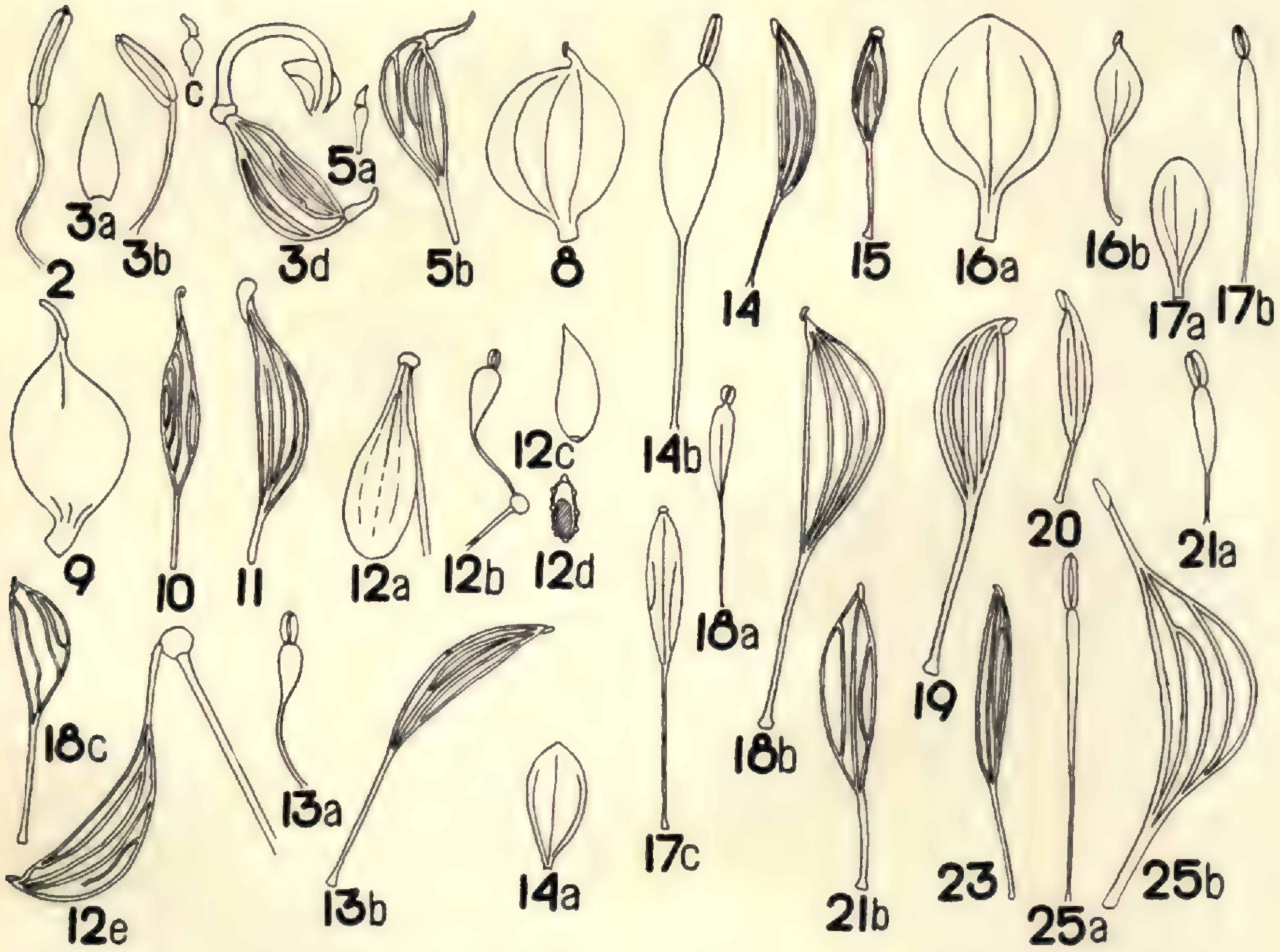
1. Thalictrum minus L.

To this species can be referred a specimen from the herbarium of John Ball and preserved in the Gray Herbarium. It was collected in Greenland by Giesecké, so says the label. C. L. Giesecké was a geologist who, between 1806 and 1813, made collections of plants on Greenland. His report was published in Brewster's Edinburgh Encyclopaedia, **10:** 100–102, 1832, and the only *Thalictrum* listed is *T. alpinum*. Thus it is not at all improbable that the label was pasted to the wrong specimen. That label, however, reads: *Thalictrum Greenland Giesecke.*

T. R. Jones, reviewing the botanical literature on Greenland in the Man. Nat. Hist. Gr., p. 256, 1875[1], casts a doubt on the accuracy of Giesecké's list. "His list", he writes, "comprehends a large number of species, but he is manifestly wrong in regard to many of them. Some, which may possibly be members of the Greenland flora, have never been found since his day."

Giesecké having spent eight years in Greenland studying the mineralogy of the country, it is not impossible that he might have chanced to botanize on peculiar spots where the local

[1] See also Trans. Bot. Soc. Edin., 9, 2: 430–465, 1868.



Details of Flowers or Fruits of Thalictrum, all × 6

(For explanation see end of paper. Note also that the "c" of "14c" has been omitted by error.)

geological formations supported an endemic flora. Greenland is reputedly well known botanically, but as recently as 1937, Polunin reported seven new species from the Julianehaab sector alone and confirmed six doubtful previous reports. Although the flora of that "subcontinent" shows more affinities with America than with Europe, the presence of *T. minus* sensu amplo can not be rejected *a priori*, for it is a species ranging over Eurasia and Africa from the Bering Straits to Ireland and from Arctic Norway to central Africa. For the time being it is, however, preferable to wait until some other field-botanist confirms Giesecké's specimen by collecting the plant anew.

Lecoyer in 1885 recorded over 200 synonyms of *T. minus* and no doubt many others have been coined since that time. In view of the types of these being all in Eurasian herbaria and also because that species is rather scantily represented in American

herbaria, it is preferable to leave to some other worker, who might have access to the types, the task of disentangling, *if possible*, the status of this species, for, as Prantl characterizes it, very accurately indeed, it is a "Formenchaos".

2. T. **Hultenii** sp. nov. *Planta* 35–70 cm.[1], omnino glabra nisi in cauli. *Radix* ignota est. *Caulis* arenoso-pruinosus sub tempus florendi. *Folia* caulinaria 2–4-ternata, internodos subaequantia, superiora et intermedia in apice dilatationis petiolaris sessilia, inferiora plus minusve petiolata. *Stipulae* auriculatae, plus minusve laceratae. *Stipellulae* desunt. *Foliolae* variabiles, saepius subquadratae, apice trilobatae, ca. 1.5 cm. long. *Inflorescentia* paniculata 5–10 cm. long., parum ramosa. *Pedunculi* in axilla saepe folii ternati, saepius folii simplicis, rarissime bracteae. *Flores* omnes perfecti, pauci in planta. *Sepala* paullulum cucullata, elliptica, ca. 3.0 mm. long., supera erosa, albicantia, plus minusve luteo-tincta. *Stamina* 8–15 in flore. *Filamenta* pallida *flavescentia* ca. 3.5 mm. *Antherae* oblongae vel oblongo-lanceolatae, flavae, ca. 2.0 mm., *mucrone* brevi ca. 0.1 mm. *Ovaria* 3–6 in flore, *stigmate* 0.4–0.7 mm. *Carpella* matura ignota, fere matura sessilia ventre ovoideo vel subgloboso. Floret Julio et Augusto. Alaska: *Hultén* 6753, Unalaska, July 20, 1932 (NY, type); *Van Dyke 38*, Unalaska, Makushin Bay, moist grassy places on hillsides, July 16, 1905 (G); *J. M. Macoun 115*, Unalaska, July 25, 1891 (G, NY); *Hall*, Unalaska, Iliuliuk, Oct. 1, 1871 (G); *Harrington*, Unalaska, Iliuliuk, Oct. 12, 1871 (G); *Evermann 120*, Amakuak Island, Aug. 1, 1892 (F); *Eyerdam 2278*, Unalaska, Aug. 22, 1932 (NY); *Kincaid*, Unalaska, Sept. 18, 1897 (UC); *A. E. & R. T. Porsild 641*, Inana River, Hot Springs, 64° N., 150° 20′ W., recent clearings in the vicinity of recently abandoned settlement, July 8, 1926 (G). Fig. 2.

This species has hitherto passed as either *T. kemense* Fries or *T. majus* L. or *T. minus* var. *kemense* (Fries) Trel. It differs mainly in the size of the fruit and by its contracted leafy inflorescence. Dedicated to Eric Hultén, the author of "*Outline of the History of Arctic and Boreal Biota during the Quaternary Period*", a fundamental book on the phytogeography of the Arctic-boreal floras, and of detailed works on the floras of Kamtchatka, the Aleutian Islands and Alaska. The habitat of the last cited specimen suggests that the plant might have been somewhat overlooked on continental Alaska.

3. T. alpinum L. *Planta* plus minusve stolonifera, erecta

[1] Where not otherwise indicated, all measurements in descriptions apply to the height of the plant, or the length of the organs concerned.

rigida, omnino glabra (0.5)–1.5–(3.0)–decimetralis. *Radices* fibrosae. *Folia* bi-quadriternata, basilaria 1–5, caulinarium deest vel raro solitarium, folia inferiora inflorescentiae interdum lanceolata integra, raro trilobata, saepius desunt, superiora semper desunt. *Foliolae* flabellatae, coriaceae, inferne plus minusve glaucae, 1 cm. longae vel breviores, apice 3–7-lobatae, *margine* plus minusve revoluto, *nervis* rugosis, inferne rugosioribus. *Inflorescentia* nuda racemosa, e *pedunculis* alternis ante anthesim adpressis, postea recurvatis. *Sepala* 1.5–2.3 mm. longa, ovata vel elliptica. *Stamina* 8–15 in floribus singulis. *Filamenta* ca. 3.5 mm. filiformia, ante anthesim aliquo modo flavescentia, postea tamen purpurascentia. *Antherae* 1.2–2.3 mm. longae, oblongae vel lineares, apice acutae, etsi mucronatae breviter etiam, primo flavescentes deinde virido-purpurascentes. *Ovaria* 3–6 in floribus singulis. *Stigma* ca. 0.75 mm. longum, in fructu valde reflexum ad tergum. *Carpella* matura 0–4 in pedicellis singulis, reflexa vel pendula, 2.8–3.5 cm. longa, subglobosa vel oblanceolata basi saepius attenuata vel stipitata, apice rotundata, nervata, *nervis* ca. 12, rostro ad tergum valde deflexo. Floret a Junio ad Septembrem.

The three following varieties seem to be worth recognition, although the characters of each are not absolutely constant.

3a. T. ALPINUM var. **typicum.** *T. alpinum* L., Sp. Pl., **1:** 545, 1753. *T. alpinum* var. *pallidum* Norman, Arch. Math. Naturvid. **8:** 4, 1883. *T. alpinum* var. *gaspense* Greene, Ott. Nat. **23:** 18, 1909. *T. alpinum* var. *microspermum* Greene, l. c. 1909. *T. alpinum* var. *nesioticum* Greene, l. c. 19, 1909. *T. alpinum* var. *pudicum* Greene, l. c. 1909. *Planta stolonibus* plus minusve elongatis horizontalibus, raro caespitosa. *Radices* paucae saepius sparsae. *Foliolae* supernae laete virides saepius valde lucidae nec glaucae. *Ovaria* saepius obovata vel subglobosa, sessilia vel subsessilia. *Carpella* matura *stipite* 0.5 mm. vel breviore vel deente.—GREENLAND: *Vahl. f.* (G); *A. E. Porsild 257*, south coast of Disko Island near Godhavn, 69° 14′, fertile slopes near the warm springs, July 27–28, 1937 (G); *Seidenfaden & Ostenfeld 296*, East Greenland, northern side of the head of Husk-ax Fiord, 73° 38′, Aug. 15, 1929 (G); *M. P. Porsild & R. T. Porsild*, Vest-Grønl., Ubekendt Eijland, Igdlorssuit, 71° 14′, 21 juli, 1929 (G); *Eugenius*, Groenl. occid., ca. Neria, 61° 33′, 26 juli, 1935 (G). LABRADOR: *Bell 874*, Cape Chudleigh (C); *Fernald & Wiegand 2430*, Blanc Sablon, limestone and calcareous sandstone terraces, Aug. 6, 1910 (G). NEWFOUNDLAND: *Robinson & Schrenk 26*, marsh near confluence of Exploits River and Badger Brook, Aug. 13, 1894 (ANS, G, isotypes of *T. alpinum* var. *microspermum*); *Fernald & Long 28,272*, Quirpon Island, wet boggy tundra in central Valley, Aug. 7, 1925 (G); *Fernald, Long & Fogg 1703*, Old Port au Choix,

turfy and peaty margins of dry gravelly limestone barrens, July 22, 1929 (G); *Fernald & Wiegand 5443*, Millerton Junction, dry bog, July 7, 1911 (G); *Fernald, Long & Dunbar 26,690*, Brig Bay, peaty and turfy knolls or slopes on limestone barrens, Aug. 6, 1924 (G). Québec: *Victorin & Rolland 25,441*, Minganie, Île Saint-Charles, près de la tourbière du lac Salé, 20 juillet, 1926 (G); *Victorin & Rolland 21,156*, Minganie, Grande Ile, talus humide sur le rivage, avec *Anemone parviflora*, 20 juillet, 1925 (G); *Pursh*, Anticosti (G); *Macoun 3*, Anticosti, valley of Jupiter River, Aug. 20, 1883 (C, type of *T. alpinum* var. *nesioticum;* G, isotype); *Victorin, Rolland & Louis-Marie 21,155*, Anticosti, rivière Vauréal, sur les talus humides le long de la rivière, 27 juillet, 1925 (G); *Fernald*, Gaspé Co., banks of the Grand River, damp ledges, June 30–July 3, 1904 (C, type of *T. alpinum* var. *gaspense*, G, isotype); *Fernald & Collins 1046*, Gaspé Co., Bonaventure Island, Bonaventure conglomerate (calcareous) sea-cliffs, Aug. 7 & 8, 1905 (G); *Pease & Smith 25,761*, Matane Co., Mt. Logan, talus of mica schist, chimney east of Razorback Ridge, alt. 850–1000 m., July 13, 1923 (G). Yukon: *A. Müller*, Lake Kluane to Don Jek River, Aug. 11–27, 1920 (ANS). Alaska: *Blaisdell*, Cape Nome, 1900 (G); *J. P. Anderson*, Juneau, rocky alpine, June 30, 1940 (G); *A. E. & R. T. Porsild 789*, Norton Sound, Pastolik, 62° 22′ N., 163° W., coast and low swampy tundra, growing on the sides of large "niggerheads", not common, July 20, 1926 (G); *J. P. Anderson 452*, Juneau, July 4, 1917 (NY). Siberia, primorsk: *Wright*, Behring Straits, Arakamtchetchene Island, 1853–1856 (G, US); *Tiling*, Ajan (G). yakutsk: *Nilson*, Balaganach, June 27, 1898 (US). transbaicalia: *N. & V. Ikonnikov-Galitzky* 288, montes Kentei orientales and fontes fluvii Kerulen, July 18, 1928 (NY). yenisseisk: *Kusnezow & Reverdatto 973*, distr. Turuchansk, 1914 stylo veterum[1] (NY). tomsk: *Krylov*, Altai, Margalinsky bjelok, prope pagum Nishnij Uimon, June 11, 1901 (NY); *Schischkin, Chilikina & Sumnevicz*, Altai, in jugum Terk-Tynsky fluminis, Kostachta, July 4, 1931 (NY). Turkestan: *Saposhonkov*, in jugo Tian-Schan, in alpinis, June 28, 1902 (NY). Russia, Archangel: *Steffen 567*, Vaygach Is., Aug. 16, 1926 (C). Volgda: *Soczava*, montes uralenses inter 62° et 64°, July 20, 1928 (C). Nova Zembla: *Weber*, 1891 (F); *Tolmatschew 416*, insula semptentrionalis, in decliviis siccis ad flumen Notschujew in vic. radiostat. Matotschkin, July 23, 1922 v. (G). Spitzbergen: *Haley*, King's Bay, July 6–8, 1935 (G). Lapponia: *Anderson 84*, 1869. Sweden: *Õrtendal*, Östersund, Jmelland, 1890 (G); *Asplund*, Torneträsk-området, Nuoljas nordsida, July 19, 1917 (F); *Sjorgren*, in alpe Areskutan, 1846 (G); *Alm 6523*, Torne

[1] Abbreviated elsewhere throughout this paper as *v.* or *g.*

Lappmark, Jukkasjärvi s:n, in monte Kaisepakte, alt. ca. 750 m., July 18, 1926 (G); *Tedenius*, Herjedal bor. occid., Malmagen, julio (G). NORWAY: *Taylor*, Ruostavand, Tromsö, July–Aug., 1907 (G); *Fidtz*, Opdal i Sör-Tröndelag, Kalvellafossen, Aug. 11, 1910 (G); *Bocck*, 1869 (US); *Hid*, Voss: Finnesleigen, i fjóra ved Vangevalnet, 46 m. o. h. (G). FAROË ISLANDS: *Taylor*, Viderö Island, Videreite, 1903–1906 (G); *Hartz & Ostenfeld*, insula Suderö, Kvalbófjaed, July 21, 1897 (G). SCOTLAND: *J. R. Jack*, Perthshire, Ben Lin, July, 1922 (G); *Clova*, 1832 (G). ENGLAND, DURHAM: *Edmondson 4691*, upper Teesdale, Widdybank, wet places, June 27, 1909 (G). WESTMORELAND: *Beanland*, Tarn Craggs, Helvellyn, June 29, 1909 (G). YORKSHIRE: *Lees*, alt. 1600 ft., June 1872 (F). ROSSSHIRE: *Stables*, moor behind Rosebough, growing with *Pinguicula* among cowfields, June 1, 1843 (G). WALES: *Ball*, North Wales, mountains near Llanberis, May 30 & 31, 1859 (F); *Ball*, North Wales, Carnarvonshire, rocks on Snowdon, 1850 (G). ICELAND: *Seidenfaden 969*, eastern Iceland, Seydisfjord, 65° 17′, grass heath, June 27, 1929 (NY); *Sørensen*, Skagafjord, July 1, 1930 (G); *Paulsen*, SW-Iceland, Haonefjord, Hvanu, July 4, 1904 (G); *Scamman 1371*, Lakjamot, a farm in the north on the road between Stadur and Blönduos, Sept. 1–4, 1938 (G); *Scamman 1370*, Reykjavik, Aug. 2–19, 1938 (G); *Taylor*, N. Iceland, Sula mountains nw. of Akuseyvi, June 27, 1895 (G). Type, not seen, from Scandinavia, presumably preserved at the Linnaean Society of London. FIGS. 3a, b and c.

Var. *pallidum* Norman, is the early stage of the plant when the leaflets are strongly glaucous beneath. Type not seen.

Greene's four varieties are rather descriptions of individuals than of taxonomic units. Types in the National Herbarium of Canada seen, except of var. *pudicum* for which Greene did not authenticate nor indicate any typical collection nor any definite distribution. The characters stressed by Greene to separate his varieties are mainly the following: height of the plant; average number of leaflets per leaf; curvature of the pedicels; number of carpels per flower; insertion of the carpel. All these characters exhibit such a degree of variation that the isotype of var. *microspermum* at the Gray Herbarium does not correspond to the description of the type as to the height of the plant (10 to 14 inches), the number of leaflets per leaf (13 to 23), as to form of leaflets (often broader than long and as often 4–5-lobed as 3-lobed), the description of veinlets (either prominent or not), curvature of pedicels (straight to strongly recurved), number of

carpels (one or two per flower, the specimens being overmature and most of the fruits gone), and insertion of the carpels (definitely short-stipitate). And so on.

The following year[1], Greene proposed seven new species, all based on material from the western United States. Plus the characters already discussed, he emphasized the following: leaflets shining or dull, pale or dark green; sex of the plant; size and form of the stamen; length of petiole; size and form of the leaflets. Of these seven species we can say the same as has already been said about the varieties. Two characters, however, prove to be rather constant and characteristic of the western American specimens. In most cases the leaves are of a pale green and always dull on the upper surface, the latter character being the most constant of the two. On the other hand, all the material from Gaspé Peninsula to Greenland and from Alaska has leaflets of a rather dark green color and definitely shining on the upper surface. A few, very few, intermediates were encountered. Such an intermediate was *Hall & Harbour 10*, from Colorado, which happens to be the type-collection of *Thalictrum scopulorum* Greene. Some specimens from the Pyrénées are equally more or less shining on the upper surface of the leaflets.

4. T. alpinum var. **hebetum,** var. nov.—*T. cheilanthoides* Greene, Leaflets, **2:** 89, 1910. *T. duriusculum* Greene, l. c. 92, 1910. *T. elegantulum* Greene, l. c. 93, 1910. *T. leiophyllum* Greene, l. c. 90, 1910. *T. monoense* Greene, l. c. 93, 1910. *T. scopulorum* Greene, l. c. 91, 1910. *T. suspensum* Greene, l. c. 92, 1910.—*Planta* parum stolonifera, raro caespitosa, *stolonibus* elongatis vel ascendentibus. *Radices* paucae aggregatae. *Foliolae* superne hebetae vel raro parum lucidae, saepius plus minusve glaucae, interdum viridulae. *Ovaria* obovata vel oblanceolata, sessilia vel subsessilia. *Carpella* matura *stipite* 0.5 mm., vel breviore vel deente.—Wyoming: *E. Nelson 648*, Chimney Park, Aug. 1, 1901 (G, isotype of *T. leiophyllum*); *Rollins 2293*, Uinta Co., near Lonetree, clay hummocks, alt. 7500 ft., June 7, 1938 (G, type of *T. alpinum* var. *hebetum*); *E. B. & L. B. Payson 4413*, Sublette Co., near the lower end of New York Lakes, alt. 7700 ft., July 21, 1925 (G); *A. Nelson 9064*, Albany Co., Fox Park, on hummocks in bogs, Aug. 8, 1907 (G). Colorado: *Hall & Harbour 10*, Rocky Mt. alpine flora, lat. 39°–41°, 1882 (US, type of *T. scopulorum;* ANS, G, US, isotypes); *Porter*, Upper Arkansas, Cash Creek, July 25, 1872 (ANS); *F. E.*

[1] Leaflets, **2:** 89–93, 1910.

& E. S. Clements 319, Seven Lakes, alt. 3500 m., 4 julii, 1901 (G); *Hermann 5544*, Garfield Co., 1¾ miles sw. of Trappers' Lake, trail to Flat Top, low moist meadow at edge of spruce woods, alt. 9500–10500 ft., July 31, 1933 (G); *Clokey 3533*, Chaffee Co., Grizzly Peak, moist meadow, alt. 10,500 ft., May 7, 1919 (G); *Wolf & Rothrock 94*, 1873 (G); *Parry 75*, from the headwaters of Clear Creek and the alpine ridges lying east of Middle Park, 1851 (G); *Crandalle & Cowen 30*, vicinity of Como, moist soil along stream, alt. 9775 ft., Aug. 3, 1895 (G); *Osterhout*, Laramie Co., North Park, July 25, 1898 (G); *Baker, Earle & Tracy 637* [and not *437*], above Durango, Hamor's Lake, July 24, 1898 (G-ND, type of *T. suspensum;* G, photograph of the type; NY, US, isotypes; *Brandegee 890*, Sierra Sangre de Cristo, Aug., 1879 (UC)). UTAH: *Porter*, Uinta Mountains, July 25, 1873 (ANS, G); *M. E. Jones 5826a*, U. M., creek near Fish Lake, alt. 9000 ft., Aug. 11, 1894 (US, type of *T. duriusculum*); *M. E. Jones 5733*, Fish Lake, alt. 9000 ft., Aug. 4, 1894 (US, paratype of *T. duriusculum*); *E. B. & L. B. Payson 4877*, Summit Co., foothills of Uintahs, Mill Creek, bushy hammocks in swamps, alt. 8300 ft., July 4, 1926 (G). NEVADA: *Munz 16318*, Elko Co., Ruby Mts., Lamoille Canyon, wet meadow, alt. 8500 ft., Aug. 1, 1940 (CA); *Watson 5*, northern Nevada, Clover Mountains, 40°, 1868 (US, type of *T. elegantulum;* G, isotype). NEW MEXICO: *Standley 4324*, Pecos Baldy, alt. ca. 12,000 ft., July 11, 1908 (US, type of *T. cheilanthoides;* M, NY, isotypes). CALIFORNIA: *Coville & Funston 1806*, White Mts., Cottonwood Creek, July 12, 1891 (US, type of *T. monoense;* ANS, G, isotypes); *Duran 1625*, Cottonwood Creek, open damp meadows, alt. 10,500 ft., June 27, 1926 (UC); *Duran 528*, White Mts., McAfee Mdw., alt. 11,700 ft., July 27, 1930 (Ca, G, UC); *Peirson 12,892* Inyo Co., Rock Creek Lake Basin, in meadow and lake margin at small lake at south base of the Transverse Ridge, alt. 10,800 ft., Aug. 5, 1939 (CA, UC). AUSTRIA: *Martius*, Tyrol, in alpis (G); *Jäggi 2561-I*, Tirolia occidentalis, in pratis humidis vallis Tuoi inter pagos Unter-Engadin et Patznaum, solo granitico, ca. 2300 m. (G); *Jäggi 2561-II*, Tirolia occidentalis, in pratis jugi inter montes Champatsch et Astas, ca. 2220 m. (G); *Krugier*, in Seiseralpe Tyrolis australis, solo dolomitico, alt. 2250 m., 16 julii, 1878 (F). SWITZERLAND: Grisons, Buffalora (G); *Braun-Blanquet 334*, Zentralalpen, Südwesthang des Piz Daint, Münstertal 2500 m. vom Schmelzwasser durchfeuchter Weiderasen, zehr zahlreich eingestreut neben *Viola calcarata, Gentiana verna*, etc. Aug., 1920 (G). ITALY: *Longa 1475*, Longobardia super., prov. di Sondrio, Bormio, in pratis uliginosis et secundum rivulos vallis di Fraele, solo vario, alt. 1800–2300 m., 27 junii, 1905 (G); *Baenitz*, Cantoniera Santa Maria, Giogo di Stelvio, alt. 2535 m., June 27, 1878 (F). FRANCE, ALPS: *Girod*, hautes Alpes, gap à St. Mens, alt. 1600 m., juillet, 1905 (G); *Magnier 2623*,

basses Alpes, Larche, Arvet Touvet, Guiguet, sources du Var à Esteine, dans les prairies tourbeuses, 16 juin, 1875 (G); Alpes maritimes, Lac de Vens, 29 juin, 1898 (F); *Lebrun*, Alpes maritimes, St. Etienne, Lac de Rabuons, gazons humides, alt. 2410 m., 7 sept., 1919 (F). Pyrénées: *Rugel*, Pyrénées-Orientales, val d'Eynes (G, NY); *Suizet*, val d'Eynes, 11 juillet, 1890 (F); *Irat 51a*, Pyrénées Orientales, vallée de Carol, in pascuis editioribus prope Porta, 1 juillet, 1846 (NY); *Bordère*, Hautes-Pyrénées, pic du Campvieil, 1891 (F); *Bordère*, Hautes-Pyrénées, Trémouse, août 1864 (F); *Irat*, Hautes-Pyrénées, Vignemale, ad nives, 3 sept., 1846 (F); Pyrénées, Port de Pinède (F). Spain: *Bourgeau*, Castanesa, Bassibes, août, 1847 (G).

5. T. alpinum var. stipitatum Yabe, Bot. Mag. Tokyo, **17:** 20, 1903. *T. marginatum* Royle, Ill. Bot. Himal. **1:** 51, 1839. *T. microphyllum* Royle, l. c. 1839, nec *T. microphyllum* Anders. Bull. Soc. Bot. Belg. **24:** 292, 1885, *nomen nudum*, ex synonymis *Thalictri minoris* L. var. *elati* Lec. *T. bracteifilum* Bertol. Mem. Ac. Sc. Bolog. II, **3:** 422, 1843. ? *T. acaule* Cambess. ex Hacquemont, Voy. Ind. **4,** Botanique, 3, 1844. ? *T. alpinum* var. *elatum* Ulbrich, Not. Bot. Gart. Mus. Ber. **10:** 877, 1929. *T. alpinum* var. *microphyllum* Handel-Mazzetti, Symb. Sin. **7,** 2: 311, 1931. *T. nippono-alpinum* Honda, Bot. Mag. Tokyo, **53:** 334, 1939.—*Planta* stolonifera et caespitosa, *stolonibus* paucis elongatis horizontalibus, pluribus ascendentibus. *Radices* numerosae fasciculatae. *Foliolae* supernae saepius viridulae, nonnunquam paululum glaucae, interdum parum lucidae. *Ovaria* stipitata oblanceolata. *Carpella* matura *stipite* 0.5–2.5 mm. longo.—Nippon, hondo: *Takemoto 591*, Sinano, Aug. 9, 1923 (G). China, szechwan: *Rock 17,865*, northeast of Kula, Mount Siga, on alpine meadow, alt. 4600 m., June, 1929 (F, NY, US); *Rock 16,253*, west of Muli Gomba, Mount Mitzuga, high alpine screes, alt. 4780 m., June, 1928 (US); *Rock 5554*, Muli Kingdom, alt. 16,000 ft., June, 1922 (US); *Rock 16,405b*, Kondaling, Risonquemba, Mount Konka, on alpine meadow, alt. 4770 m., June–Aug., 1928 (US). yunnan: *Handel-Mazzetti 4696*, ad austro-orient. pagi Dschungdien (Chungtien) in lateris occid. montis Piepun, regione alpina, in glarea mobili, substr. calceo, alt. 4300–4650 m., 11 aug., 1914 (US); *Rock 4951*, Yangtze watershed, distr. of Likiang, eastern slopes of Likiang Snow Range, on limestone gravel, alt. 16,500 ft., July 8, 1922 (US); *Rock 9444*, Yangtze watershed, eastern slope of Likiang Snow Range, alt. 14,000 ft., July, 1923 (US). India, sikkim: *J. D. Hooker*, regio alp. alt. 15,000 ped. (G). kumaon: *Strachey & Winterbottom 1*, Barjikang pass, alt. 15,000 ft., (G). garhwal: *Strachey & Winterbottom 2*, Bompras, alt. 14,500 ft. (G); *Duthie 3795*, above Bhowani, alt. 12,000–13,000 ft., Sept. 16, 1885 (US). punjab: *Koelz 792*, Lahul, Khaksar, alpine meadow, alt. 15,000 ft., July 29, 1930

(NY); *Koelz 116*, Kulu, Chanduakani, alt. 12,000 ft., 1930 (NY); *Koelz 8610*, Chamba, Kukti Pass, alt. 14,000 ft., July 3, 1936 (NY); *Koelz 5039*, Kangra, Rotang La, alt. 12,000 ft., June 30–July 1, 1933 (NY, US); *Koelz 6851*, Kangra, Lahul, Drokpo Gongma, alt. 15,000 ft., Aug. 29–30 (US). KASHMIR: *Thomson*, Kishtwar, regio alpina, alt. 11,000 ped. (G); *Thomson*, Ladakh, regio alp. alt. 15–16,000 ped. (G, NY); *Falconer 22* (G); *R. R. Stewart 9776a*, Sonamarg, alt. 12,000 ft., July 23, 1928 (NY), *R. R. Stewart 19,873*, Gilgit Rd., Burzil Pass, alt. ca. 14,000 ft., July 27, 1940 (NY); *R. R. Stewart 19,997*, Deosai, near Mir Panzil Pass, alt. ca. 14,000 ft., July 28, 1940 (NY); *R. R. Stewart 18,275*, to Gadsai from Gangabal, alt. ca. 12,000 ft., Aug. 11, 1939 (NY); *T. T. Stewart 7814*, Tulion, above Pahlgam, alt. ca. 13,000 ft., July 13, 14, 1925 (NY); *Koelz*, Rupshu, Tso Kar, among dry rocks along stream, alt. 15,000 ft., June 30, 1931 (NY, US). FIGS. 5a and b.

No type material has been available of any of the taxonomic units concerned. Var. *elatum* Ulbrich was described from specimens having the flowers of *T. alpinum* L. but the vegetative characters of *T. Esquirolii* Lévl. & Vant. The flowers of those two species are not very different. One flowering specimen from the Burma-Thibet frontier, *Ward 9804*, can be referred here only doubtfully until the fruits are known.

6. T. RUGOSUM Aiton, Hort. Kew. **2:** 263, 1789. *T. flavum* L. β *speciosum* Reichard, Syst. Pl. **2:** 648, 1779. *T. speciosum* (Reichard) Poir. Encyc. Bot. **5:** 315, 1804, nec *T. speciosum* Miller, Gard. Dict. ed. 8, no. 2, 1768. *T. glaucum* Desf. Tabl. de l'École de Bot. **2:** 146, 1815, *nomen nudum*. *T. crenatum* Desf., l. c. 196, 1815, *nomen nudum*. *T. densiflorum* HBK. ex DC. Syst. **1:** 184. 1817. *T. glaucum* Desf. ex DC. l. c. 1817. *T. rugosum* Ait. β *umbelliferum* DC. l. c. 185, 1817. *T. discolor* Willd. ex Lec. Bull. Soc. Bot. Belg. **24:** 267, 1885, *nomen nudum*. *T. purpurascens* L. var. *rugosum* (Ait.) Farwell, Pap. Mich. Ac. Sci. **26:** 11, 1941.

T. rugosum Ait. was described from material cultivated in the Botanical Garden at Kew and was said to have been introduced from America. But Lecoyer, who has seen the type specimens, states that it is *T. glaucum* Desf. Apparently the Kew Gardens distributed seeds from the type-colony of *T. rugosum* Ait., for John Bartram cultivated it and so did Purdue University as late as 1924 and the Missouri Botanical Garden in 1902. Schweinitz got the plant from Bartram for his own harbarium and Muhlenberg also had it as one of his four American species. There

seems to be no doubt that the plant was never native in America and that Aiton's surmise was erroneous. A. P. De Candolle also saw the plant cultivated in a European garden under the name *T. rugosum* Ait. Apparently this plant was cultivated in America during the eighteenth century, at least in the United States, Mexico and Peru. A photograph of the type of *T. densiflorum* HBK. was lent to me by the Field Museum. It shows a plant in all points similar to *T. rugosum*. The name *T. rugosum* Ait. antedates both *T. glaucum* Desf. and *T. speciosum* Poir. and must supersede them as the oldest name of the plant of southern Europe and northern Africa.

Sectio **Genuina** (DC.), stat. nov.—Sect. *Thalictrum*, subsect. *Genuina* DC., Syst. **1:** 169 & 175, 1817. Species typica *T. foetidum* L., typus generis, sit (p. 347).

Sectio **Leptostigma,** sect. nov. Stigmatibus angustissimis nec alatis. Species typica *T. saniculaeforme* DC. sit.

Among other species belonging to this group are: *T. Dalzelli* Hook., *T. Falconeri* Lec., *T. rotundifolium* DC., *T. rufum* Lec., *T. Rochebrunianum* Franch., *T. tuberosum* L., *T. virgatum* Hook. f. & Thom. None of them grow wild in America.

Sectio **Erythrandra,** sect. nov. *Filamenta* antherarum apice clavata, alba vel rufescentia. *Carpella* sessilia vel breviter stipitata, costata, inflata. *Stigma* nunquam alatum nec sagittatum. Species typica *T. petaloideum* L. sit.

A section including *T. calabricum* Spreng., *T. Fortunei* Moore, *T. javanicum* Blume, *T. podolicum* Lec., *T. sachalinense* Lec., *T. thibeticum* Franch. and others. This section is not represented in America.

7. T. leucostemon Koch & Bouch., Append. Ind. Sem. Hort. Berol. 13, 1854.

This species, erroneously attributed to America, probably belongs here. According to Lecoyer there does not seem to exist any type for this species.

Sectio Physocarpum DC.—Syst. **1:** 171, 1817. *Physocarpum* Bercht. and Presl, O Priroz. Rostl. **1:** 14, 1823, ut genus. Subg. *Physocarpidium* Reichenb. Cons. Regn. Veg. 192, 1828. *Compressicarpum* Lecoyer, Bull. Soc. Bot. Belg. **16:** 223, 1878, divisio ordinis indeterminati nomenque alternativum pro *Physocarpo*. *Sumnera* Nieuwl. Amer. Mid. Nat. **3:** 254, 1914, ut genus. *Clavata* Small, Man. South. Fl. 524, 1933, divisio

ordo cujus indeterminatus.—*Plantae* saepius glabrae, *foliis* estipellulatis, caulinariis paucis nisi desunt, *radicibus* nonnunquam tuberosis. *Pubescentia*, si adest, e pilis uniseriatis translucidis. *Inflorescentia* corymbosa, nonnunquam pauciflora, raro elongata. *Flores* perfecti. *Sepala* spathulata vel obovata, interdum unguiculata. *Filamenta* alba, clavata ad apicem. *Antherae* albae vel pallido-luteae. *Carpella* matura pauca stipitata nervosa, plus minusve compressa, nec costata, *nervis* tamen saepius rugosis et fere simplicibus. *Stigmata* brevissima vel globosa, subsessilia vel sessilia, florendi tempore a sepalis recedentia, marcescentia. Species typica *T. clavatum* DC. sit.

This subdivision of the genus was first created by De Candolle as a section and all five synonyms given were based on sect. *Physocarpum* DC. It included at first four species, three of which are now in other sections. Many subsequent authors have recognized this unit, always retaining *T. clavatum* and dropping the other three species. This procedure is followed here, for the characters given by De Candolle clearly show that he regarded that species as typical of his newly proposed section.

As most of the types of species belonging to this section are not accessible, it has not been possible to give a complete synonymy except for the American species. Furthermore, the material at hand is not quite abundant enough for a thorough treatment of this section. Since Lecoyer in his monograph treated only three species of this group, it is thought desirable to give a key to the sixteen species I recognize, cite at least some collections of each species and give a full treatment of the American species only, leaving out of the picture all species for which there is no herbarium material available to me.

a. Folia caulinaria triternata 2–6, stipulis laceratis. Carpella matura lignosa, ventre globoso, nervis obscuris. . . .*b.*
- *b.* Stigma ovatum vel ellipticum, semimillimetrale vel brevius 8. *T. baicalense.*
- *b.* Stigma recurvatum, circinatum etiam, millimetrale lineare. 9. *T. baicalense*, var. *megalostigma.*

a. Folia caulinaria 0–2, stipulis integris. Carpella matura pariete membranaceo, nervis saepius rugosis. . . .*c.*
- *c.* Stigma lineare millimetrale. Planta 15–40 cm. . .10. *T. philippinense.*
- *c.* Stigma ovatum vel discoideum vel globosum semimillimetrale vel brevius. . . .*d.*
  - *d.* Foliolae peltatae. . . .*e.*
    - *e.* Foliolae saepius ovatae, basi integrae, apice acutae 23. *T. ichangense.*
    - *e.* Foliolae coriaceae orbiculares, per marginem totam grandidentatae. . . . . .24. *T. coreanum.*
  - *d.* Foliolae haud peltatae. . . .*f.*

f. Foliolae oblongo-lineares integrae, nisi interdum lobis 2–3 . . . . 22. *T. integrilobum.*

f. Foliolae dentatae. . . . *g.*

g. Folia caulinaria duo opposita orbicularia simplicia. Radix stolonibus longis . . . . 11. *T. filamentosum.*

g. Folia caulinaria vel desunt, vel alternantia, vel 1–2 ternata sunt. . . . *h.*

h. Foliolae infernae pubescentes. . . . *i.*

i. Carpella ventre lanceolato. . . . *j.*

j. Carpella falcata. Foliolae cordatae asymetricae . . . . 13. *T. declinatum.*

j. Carpella parum asymetrica. Foliolae basi rotundae . . . . 14. *T. acutifolium.*

i. Carpella ventre obovoideo vel rhomboideo 16. *T. unguiculatum.*

h. Plantae omnino glabrae. . . . *k.*

k. Carpella matura ventre falcato oblanceolato 4–5 mm. longo, nervo ventrali concavo. . 12. *T. clavatum.*

k. Carpella matura nervo ventrali convexo vel fere recto. . . . *l.*

l. Carpella matura ventre lanceolato. . . . *m.*

m. Planta ca. 5 dm. alta; inflorescentia subcorymbosa vel elongata, foliolis fere ovatis 2–8 cm. longis. . . . *n.*

n. Carpella matura ventre 3.0–3.2 mm. longo; stamina 7–9 mm.; antherae millimetrales . . . . 14. *T. acutifolium.*

n. Carpella matura ventre 4.0–5.3 mm. longo; stamina ca. 3 mm.; antherae 0.5–0.8 mm. . . . . 21. *T. Chiaonis.*

m. Planta 1–2 dm. alta; flores 3–9; foliolae 0.5–2.0 cm.; stamina 4–5 mm. . . . . *o.*

o. Foliolae fere orbiculares. Stamina ca. 5 mm. Stigma discoideum sessile. Carpella matura stipite ca. 3.5 mm. 17. *T. Gueguenii.*

o. Foliolae rhomboideae. Stamina ca. 4 mm. Stigma elongatum insertum ad styli ventrum. Carpella matura stipite 1.2–1.5 mm. . . . . 20. *T. Watanabei.*

l. Carpella matura ventre obovato vel ovato vel elliptico vel semiobovato. . . . *p.*

p. Carpella ventre et stigmate fere symetricis. Stigma sessile depresso-globosum. 15. *T. microgynum.*

p. Carpella nervo dorsali multo convexiore quam ventrali. Stigma discoideum, insertum ad ventrum vel styli brevis, vel ventri apicalis. . . . *q.*

q. Stamina 2–4 mm.; carpella matura 1.0–1.2 mm. lata . . . . 18. *T. mirabile.*

q. Planta semimetralis; stamina 5–6 mm.; carpella matura ventre 3–4 mm. longo, 1.4–1.8 mm. lato . . . . 19. *T. tuberiferum.*

8. T. baicalense Turcz. ex Ledeb. Fl. Ross. **1:** 7, 1841. *T. baicalense* Turcz. Bull. Soc. Imp. Nat. Mosc. **2:** 85, 1838, nomen nudum.—Siberia, amur: *Korshinsky*, Amur medius, 1891 v. (US); *Korshinsky*, Permikina, 18 Avr., 1891 g. (G); *Korshinsky*,

Khabarovka (na Amurye), 22 Maya, 1891 g. (G); *Maak*, ad fluvium Amur (G). Nippon, hondo: *Masamune*, Nikko, July 3, 1926 (NY). Mandshuria: *Schrenk 173*, ad fluv. Amur, 1855 (G). China, kansu: *Ching 1003*, vicinity of Choni, alt. 3100–3300 m., Sept. 7–15, 1923 (US); *Ching 360*, Hsia Mo K'ou, near Lichen, alt. 2000 to 2300 m., July 7–8, 1923 (US); *Rock 12,862*, T'ao River basin, banks of T'ao river, opposite Choni, flowers greenish, alt. 8200 ft., July, 1925 (G). Fig. 8.

9. T. baicalense Turcz. var. **megalostigma**, var. nov.—*Stigma* lineare recurvatum, circinatum etiam, millimetrale.—China, szechwan: *Fang 3619*, Kangtin Hsien, Tachienlu, in thickets, herb 3 ft., alt. 9000–9500 ft., Sept. 27, 1928 (G, type; US, isotype); *Wang 21,377*, ascending to Fu-pien Hsien, roadside, thicket-floor, alt. 3400 m., June 19, 1930 (G), herb 3 ft. Fig. 9.

10. T. philippinense C. B. Robinson, Bull. Torr. Bot. Club, **35**: 65, 1908.—Philippines, luzon: *R. S. Williams 957*, prov. Benguet, Baguio, June 22, 1904 (NY, paratypes); idem *1137*, June 22, 1904 (NY, type; G, isotype); *Merrill 7767*, Benguet subprovince, May, 1911 (US). Fig. 10.

11. T. filamentosum Maximovicz, Prim. Fl. Amur. 13, 1859. —Siberia, primorsk: *Palczewsky*, Vladivostok, Mt. Orlinoe Gnezdo (Eagle Nest), May 5, 1905 v. (NY); *Saverkina 99*, June (or July) 15, 1929 v. (NY); *Topping 2060*, Vladivostok and vicinity, May–Oct., 1919 (US). amur: *Maximovicz* (G, isotype?); *Komarov 725*, vallis fluminis Sutar, 12 junii, 1895 v. (NY, US); *Korshinsky*, 1891 v. (US); *Korshinsky*, Bidzhanskii, 8 June, 1891 (G). Fig. 11.

12. T. clavatum DC. Syst. **1**: 171, 1817.—*Physocarpum clavatum* (DC.) Bercht. & Presl, O Priroz. Rostl. **1**: 14, 1823. *T. filipes* Torr. & Gray, Fl. N. Amer. **1**: 38, 1838. *T. nudicaule* Schweinitz ex Torr. & Gray, Fl. N. Amer. **1**: 39, 1838. *Sumnera clavata* (DC.) Nieuwl. Amer. Midl. Nat. **3**: 254, 1914.—*Planta* omnino glabra. *Caulis* luteolus glaber 1.5–7.0 dm. altus, persaepius solitarius et semimetralis. *Radices* paucae fibrosae nigricantes, aliquantulum ad originem tuberosae. *Folia* caulinaria biternata petiolata, saepius tamen desunt. *Foliolae* 1.0–5.0 cm. long., 0.8–6.0 cm. lat., forma variabiles, subalbicantes inferne. *Inflorescentia* subcorymbosa. *Sepala* spathulata alba, 2.5–4.0 mm. longa. *Stamina* 4–5 mm., ca. 30. *Filamenta* 3.5–4.5 mm., saepe crassiora quam antherae. *Antherae* ovoideae, 0.3–0.5 mm. long. *Ovaria* 4–11. *Carpella* matura 7 vel pauciora per receptaculum, falcato-oblanceolata, 7–8 mm. long., *stipite* 2.2–3.0 mm., ventro 4–5 mm. long., *nervo* ventrali concavo. *Stigma* ca. 0.3 mm., discoideum, insertum contra ventrem *styli* ejusdem longitudinis. Floret ab Aprili ad Junium.—Virginia:

Schweinitz, Patrick Co. (ANS, type of *T. nudicaule;* NY, fragment). NORTH CAROLINA: *Radford & Stewart 1787,* Wilkes Co., growing at spring in a shady bend of the road up Pores Knob Mt., north exposure, July 2, 1940 (NC); *Magee,* Lickstone Mt., June 10, 1897 (G); *Curtiss 28,* Roan Mt., moist rocky ravines, alt. 6100 ft., July (G, NY); *Churchill,* Polk Co., Melrose, May 19, 1899 (M); *Churchill,* Watauga Co., Blowing Rock, Glen-Bernie, water-fall, June 16, 1899 (M); *Biltmore Herbarium 1015b,* Biltmore, wet places, May 6th and June 18th, 1897 (G, M, NC); *M. A. Curtis,* mountains of North Carolina (NY, type of *T. filipes*). SOUTH CAROLINA: *Peattie,* Greenville Co., Hogback Mts. (G); *J. D. Smith,* Caesar's Head, wet rocks, Aug. 1, 1881 (G). GEORGIA: *Underwood,* Taccoa Falls, Apr. 20, 1891 (NY); *Leeds 2011,* Union Co., on branch of Helton Creek, 1 mile n. of Frogtown, dripping rocks, alt. 3850 ft., June 1, 1934 (ANS). TENNESSEE: *Ruth,* Thunder-Head Mt., border of streams, elev. 6663 ft., July, 1894 (M); *Jennison & Sharp,* Fentress Co., Jamestown, Buffalo Cave, wet sand, rock, cliffs, May 17, 1931 (US); *Svenson 8901,* Marion Co., Cumberland Plateau, about 5 miles se. of Sewanee, dripping sandstone rocks, alt. 1800 ft., June 22, 1938 (G); *Svenson 10,158,* Grundy Co., east of Tracy City, Deer Lick, in spray of waterfall, May 15, 1939 (ANS, G); *Ruth 1799,* near Wolf Creek, along a mountain brook, June, 1896 (NC, NY); *Eggert,* Franklin Co., no. of Sherwood, shady rocks, June 8, 1897 (M). FIGS. 12, a–e.

The type is in the Paris Museum. It has not been studied, but the description is clear and Delessert's plate (Icones Sel., **1:** tab. 6, 1820), presumably drawn from the type, represents this species beyond any doubt.

13. T. **declinatum,** sp. nov. *Planta* semimetralis, in petiolis petiolulis foliolisque infernis pubescens. *Radices* fibrosae nigricantes, paululum ad originem incrassatae. *Folia* inferiora biternata, caulinaria desunt, inflorescentiae ternata. *Foliolae* ovatae asymetricae dentatae, basi cordatae, apice acutae, ca. 4 cm. long. et ca. 3 cm. lat. *Stamina* ca. 3.5 mm. *Filamenta* ca. 3 mm., latitudinis antherarum. *Antherae* oblongae, 0.5–0.7 mm. *Carpella* matura falcata, ca. 7 mm. longa, stipite ca. 3 mm., ventre lanceolato ca. 3.5 mm. longo et 1.0 mm. lato, nervo ventrali fere recto vel parum concavo. *Stigma* ca. 0.3 mm., modo *Thalictri clavati; stylus* idem. Floret Junio et Julio.—CHINA, KWEICHOW: *Tsiang 5662* pro parte, Tze-min-an. Tuyun, in dense shade, flower white, alt. 880 m., July 7, 1930 (NY, TYPE). FIG. 13, a and b.

14. T. **acutifolium** (Handel-Mazzetti), stat. nov.—*T. clavatum* DC. var. *acutifolium* HAND.-MZT. Anz. Wiss. Wien, Math.-

nat. Kl. **63:** 8, 1926.—*Planta* 25–65 cm., glabra vel raro foliolis infernis pubescentibus. *Radices* nigricantes plus minusve tuberosae. *Folia* basilaria 2–3-ternata, caulinaria saepius desunt, inflorescentiae 1–2-ternata. *Foliolae* dentatae saepius et ovatae et basi rotundae et apice acutae, ca. 5 cm. longae. *Sepala* obovata vel spathulata, ca. 2.0 mm. longa. *Stamina* 7–9 mm. *Filamenta* multo latiora quam antheris. *Antherae* oblongo-lanceolatae ad oblongo-lineares 0.8–1.3 mm. *Carpella* matura ca. 5.5 mm. longa, stipite 2.0–2.2 mm., ventre lanceolato 3.0–3.2 mm. longo et 0.6–0.8 mm. lato, nervis lateralibus 3 in utroque latere, nervo ventrali recto vel parum convexo. Floret Martio ad Junium.—CHINA, FUKIEN: *Dunn 2316*, expedition to central Fokien, April to June, 1905 (G); *Dunn 2456A*, expedition to central Fokien, April to June, 1905 (G); *Chung 7751* (NY). HUNAN: *Handel-Mazzetti 11,173*, prope urbem Wukang, in monte Yün-schan, copiose, schisto argilloso, fl. pall.-violac., alt. 600–1300 m., June 7, 1918 (US, syntype); *Wang-Te-Hui*, March, 1919 (US). KWANGTUNG: *Ko 52,821*, Yu-yen, in field, June 8, 1933 (G); *Tso 20,535* and *20,651*, Lok Chong, May, 1929 (NY). FIG. 14, a–c.

Thalictrum clavatum DC. evidently belongs to the same section as all these eastern Asiatic species but it is not especially closely related to any of them. As far as it is possible to judge, with only the original description at hand, the fruits of *T. tenerum* Huth might resemble those of *T. clavatum* more than those of any other species except *T. mirabile* Small.

15. T. MICROGYNUM Lecoyer in Hook. Ic. Pl. **18:** 1766, 1888.—CHINA, HUPEH: *Wilson 12*, western Hupeh, April, 1900 (NY, US); *Henry 3992*, Nan-t'o, near Ichang, 1885–1888 (G, ISOTYPE). SZECHWAN: *Faber* 135 (NY); *Farges 496*, district de Tchen-Kéou, alt. 1400 m., juin (NY). KWANGTUNG: *Tso 20,651*, Lokchong district, May 24, 1929 (NY). FIG. 15.

The plate acccompanying the original description is a very good representation of the fruiting stage of this species.

16. T. **unguiculatum,** sp. nov. *Planta* semimetralis. *Folia basilaria* biternata. *Folia caulinaria* desunt. *Folia inflorescentiae* ternata. *Petioli* et *petioluli* pubescentes. *Foliolae* cordatae acutae dentatae, nec lobatae, inferne pubescentes. *Inflorescentia* paniculata. *Sepala* viridia, 3.0–4.5 mm. longa, conspicue trinervata, basi pubescentia, unguiculata, *lamina* orbicularia. *Carpella* matura viridia, 3.5–4.5 mm. longa, *stipite* 1.5–2.0 mm., ventre rhomboideo vel obovato 1.5–2.0 mm. longo et 0.8–1.0 mm. lato, *nervis* obscuris, stylo ca. 4 mm., *stigmate* ca. 0.2 mm. ad ventrum *styli* inserto. Floret vero-

similiter Junio.—China, kweichow: *Tsiang 5662* pro parte, Tze-min-an, Tuyun, in dense shade, alt. 880 m., July 7, 1930 (G, type). Fig. 16, a and b.

17. T. **Gueguenii,** sp. nov. *Planta* gracillima, viridula, omnino glabra, 1.0–2.5 dm. *Caulis* tenuis. *Folia* basilaria biternata, inflorescentiae ternata. Caulinaria desunt. *Foliolae* fere orbiculares crenatae 1–2 cm. *Flores* pauci, saepius 3–5. *Sepala* alba spathulata ca. 2.5 mm. longa. *Stamina* ca. 5 mm. *Filamenta* insensibiliter clavata, fere latitudinis antherarum. *Antherae* ellipticae, 0.4–0.8 mm. *Carpella* matura symetrica ca. 7 mm. longa, *stipite* ca. 3.5 mm., ventre lanceolato ca. 3.2 mm. longo, 0.6–0.8 mm. lato, *stigmate* sessili et discoideo. Floret Aprili ad Junium.—China, kiangsi: *Gressit 1455,* Hing San, near border of Fukien, grassy rocky ridge, alt. 1300 m., June 23, 1936 (G). hunan: *Tsang 23,486,* Yi Chang district, P'ing T'ou Shan, Pai Mu village, silt, swamp, fairly common, Apr. 1–11, 1934 (G, type; US, isotype); *Tsang 23,392,* Yi Chang district, P'ing T'ou Shan, Pai Mu village, steep slope, sandy soil, thicket, fairly common, flowers white and fragrant, March 21–29, 1934 (G, US). Fig. 17, a–c.

Dedicated to Émile Gérard Guéguen, a former teacher of mine, of Belgian origin, a self-effacing, conscientious hard worker. To him I owe a good deal of what training and information were inculcated into me while going through college; to him I also owe a deep and permanent interest in science.

18. T. mirabile Small, Bull. Torr. Bot. Club, **27:** 277, 1900. *Planta* glabra gracilis 15–45 cm. *Radices* nigricantes ad originem tuberosae. *Caulis* basus saepius valde incurvatus, quia planta illa sponte crescit in locis praecipitosis et lateraliter inseritur in fissuris murorum saxosorum. *Sepala* alba obovata vel spathulata, 1.5–2.5 mm. longa. *Stamina* 2–4 mm. longa. *Filamenta* crassiora quam antherae. *Antherae* globosae vel ovoideae, 0.3–0.4 mm. *Ovaria* saepius 3. *Stigma* discoideum vel ellipticum, 0.1–0.4 mm. longum, insertum ad ventrum styli. *Carpella* matura 5.5–7.5 mm. longa, *stipite* 2.5–3.0 mm., ventre obovato vel semiobovato 2.5–4.0 mm. longo et 1.0–1.2 mm. lato, *nervis* lateralibus 3 in utroque latere, nervo ventrali fere recto vel paululum convexo, dorsali multo convexiore. Floret Maio, Junio Julioque.—Kentucky: *S. F. Price,* torrent (M); *Leeds 2107,* McCreary Co., Cumberland Falls, woods, June 21, 1934 (ANS); *Smith, Hodgdon & Brown 3662,* Madison Co., Cobwell Hollow, east of Berea, July 7, 1937 (F, G, NY, US); *Smith & Hodgdon 3928,* Wayne Co., Beaver Creek, southwest of Monticello, shady dripping ledge, July 12–14, 1937 (ANS, G, US). Alabama: *Mohr,* Winston Co., dripping rocks of mts., May 1,

1882 (US); *Mohr*, Winston Co., ad saxas madidas, in sylvis montosis, radicibus tuberosis, May 4, 1881 (F); *Mohr*, Winston Co., Davidsons Creek, dripping rocks in the mountains, May 1, 1881 (US); *R. M. Harper 3400*, Franklin Co., Dismal Branch, under sandstone cliffs on damp sandy bank, June 17, 1935 (ANS, G, N-ND, NY, US); *Earle 2212*, Little Mountain, near Moulton, under sandstone bluff, June 25, 1899 (NY, TYPE and ISOTYPE). FIG. 18, a–c.

It is surprising that this plant has not been collected at intervening localities in Tennessee. Fruits and stamens of the Kentucky specimens tend to be larger, but all characters overlap to some extent.

19. T. TUBERIFERUM Maximovicz, Bull. Acad. Imp. Sc. St. Pét. **22:** 227, 1877 [1876].—NIPPON, HONDO: *Tschonoski*, prov. Senano, 1864 (G, syntype); *Arimoto*, Mt. Iwate, July 15, 1903 (G); *Shimotsuke*, Nikko, Aug. 8, 1910 (US); *Enander*, prov. Shimatsuke, in radicibus montis Nantai-San in ripa lacus Chutzanji, 14 km. procul a Nikko, Aug. 14, 1913 (G); [*Watanabe?*] Shinshu, Togakushi, June 10, 1894 (G, US); [*Watanabe?*], Shinano, Togakushi-san, Aug. 18, 1893 (G); idem, Aug. 20, 1893 (US); *Hogg* (NY). COREA: *Komarov*, distr. Sam-su, fluvium Jalu, trajectus Shanjen, julio 7, 1897 v. (G). MANDCHURIA: *Komarov*, prov. Kirinensis, dist. Omoso, trajectus Sangta-alin, julio 24, 1896 v. (NY); *Maximowicz*, circa estuarium St. Olgae, 1860 (G, syntype); *Jankowski*, ad. fl. Sedemi (NY). FIG. 19.

20. T. WATANABEI Yatabe, Bot. Mag. Tokyo, **6:** 307, 1892. —NIPPON, HONDO: [*Watanabe*]?, Tosa prov., Nanokawa, July 11, 1892 (US, ISOTYPE?); [*Watanabe*?], Tosa prov. Nanokawa, July 11, 1893 (G). FIG. 20.

I have at hand a fairly large number of Japanese plants, the labels of which are all in the same fashion, style and handwriting, but there is no collector's name on any of them. However, one of them, *T. acteaefolium* Sieb. & Zucc. from Nanokawa, Tosa, has a second label which reads: "Plants of Japan, Coll. K. Watanabe, Purchased 1892". I presume all these specimens were collected by K. Watanabe, hence I have cited them all as [*Watanabe*?]. If this assumption is right, there is an ISOTYPE of *T. Watanabei* Yatabe at the Smithsonian Institution and perhaps also at the Gray Herbarium, for the labels of those two specimens would read exactly alike were it not for the year. This similarity, enhanced by the fact that the two sheets resemble each

other as plants from the same collection usually do, and the fact that the original description and its accompanying plate could have been drawn from these specimens without being in any way different,—all this strongly suggests that both specimens are isotypes.

T. Hayatanum Koidz. seems to be closely related to *T. Watanabei* Yatabe, but I have not seen any material of the former.

21. T. **Chiaonis,** sp. nov. *Planta* glabra 20–40 cm. *Radices* nigricantes variis modis tuberosae. *Foliolae* saepius ellipticae, crenatae vel dentatae. *Inflorescentia* corymbosa vel, si elongata, *flores* in ramis singulis corymbosae. *Sepala* obovata ca. 2.5 mm. longa. *Stamina* 3.0–3.5 mm. *Filamenta* latitudinis antherarum vel latioria. *Antherae* oblongae vel oblongo-lanceolatae, 0.4–0.8 mm. *Stigma* 0.3–0.6 mm., discoideum vel ellipticum, insertum ad ventrum *styli* brevissimi, vel ovarii apicalis. *Carpella* matura 6–8 mm. longa, *stipite* 1–3 mm., ventre lanceolato 4.0–5.3 mm. long. et 0.8–1.5 mm. lat., *nervis* lateralibus 1–3 in utroque latere, nervo ventrali plus minusve convexo, dorsali convexiore. Floret Junio Julioque.—Corea: *Uno 23,694*, Kanrasan Saisyuto, Zenranando, alt. 1700 m., Aug. 13, 1938 (G). China, anhwei: *Ching 8593*, Wang Shan, July 15, 1925 (US). kiangsi: *Chiao 18,719*, Kuling, along rocky slope, alt. 3400 ft., July 27, 1928 (NY, type; US, isotype); *Steward 2495*, Lu Shan, rocky ridge, July 17, 1922 (NY, US). Fig. 21, a and b.

22. T. integrilobum Maximovicz, Bull. Acad. Imp. Sc. St. Petersb. **32:** 477, 1888, reeditum Mél. Biol. **12:** 714, 1888.—Nippon, yezo: *Miyabe*, prov. Hidaka, Samani mountain path, June 19, 1884 (G).

23. T. ichangense Lecoyer in Hook. Ic. Pl. **18:** 1765, 1888.—China, hupeh: *Henry 6223*, 1885–1888 (G, US); *Wilson 492*, western Hupeh, May, 1900 (G, US); *Ho-Ch'ang Chow 355*, Tzu Kwei Hsien, May 27, 1934 (NY); *Ho-Ch'ang Chow 562*, Patung Hsien, June 17, 1934 (NY). yunnan: *Maire 2656* (NY, US). French Indochina: *Pételot 3063*, Chapa, juillet, 1927 (US).

24. T. coreanum Léveillé, Bull. Acad. Int. Géog. Bot. **11:** 297, 1902.—Corea: *Wilson* 9215, prov. s. Kankyo, 12½ miles from Eiko, roadsides, common, Sept. 22, 1917 (US). Fig. 23.

The status of this species is open to question and the material at hand is not satisfactory.

Sectio Omalophysa Turcz. ex Fisch., Mey. & Lall., Index Sem. Hort. Petrop. **1:** 40, 1835.—*Plantae* pubescentes pilis brevibus capitatis. *Flores* perfecti, *filamentis* staminum parum apice dilatatis albis. *Carpella* stipitata valde compressa, cum matura, *nervis* rugosis attamen nunquam elevatis in costis.

Rostrum deflexum ad tergum. Species typica: *T. sparsiflorum* Turcz., ut patet e descriptione originali.

It seems likely that *T. Przewalskii* Max. belongs here although we do not have any herbarium material which would permit checking this particular point.

25. T. SPARSIFLORUM Turcz.—*Planta* elegans plus minusve pubescens, 30–180 (saepius 75) cm. alta. *Pubescentia* translucida et minutissima e pilis capitatis. *Radices* fibrosae. *Folia* 3–4-ternata, basilaria aetate florendi saepius desunt, caulinaria saepe 5 in plantis singulis, plus minusve petiolata, superioribus exceptis, ista vero cum foliis etiam inflorescentiae omnibus semper sessilia sunt. *Stipulae* auriculatae erosae. *Stipellulae* desunt. *Foliolae* inferne paululum pallidiores, superne glabrae, circuitu variabili, saepius tamen basi vel rotundae vel cordatae, apice vel crenatae vel trilobatae. *Inflorescentia* foliosissima. *Flores* albi. *Sepala* elliptica 3–4 mm. longa. *Filamenta* apice paullum incrassata saepius dimidium latitudinis antherarum. *Antherae* ovatae vel oblongae parum si vero mucronatae. *Ovaria* laminaria stipitata. *Stigma* 0.5–1.0 mm., una cum stylo 1.0–1.5 mm. *Carpella* matura valde compressa semi-obovata, *nervis* lateralibus nonnunquam ramosis nec tamen sinuosis. *Rostrum* deflexum ad tergum et paululum incurvatum. Floret junio julioque aliquandiu augusto etiam.

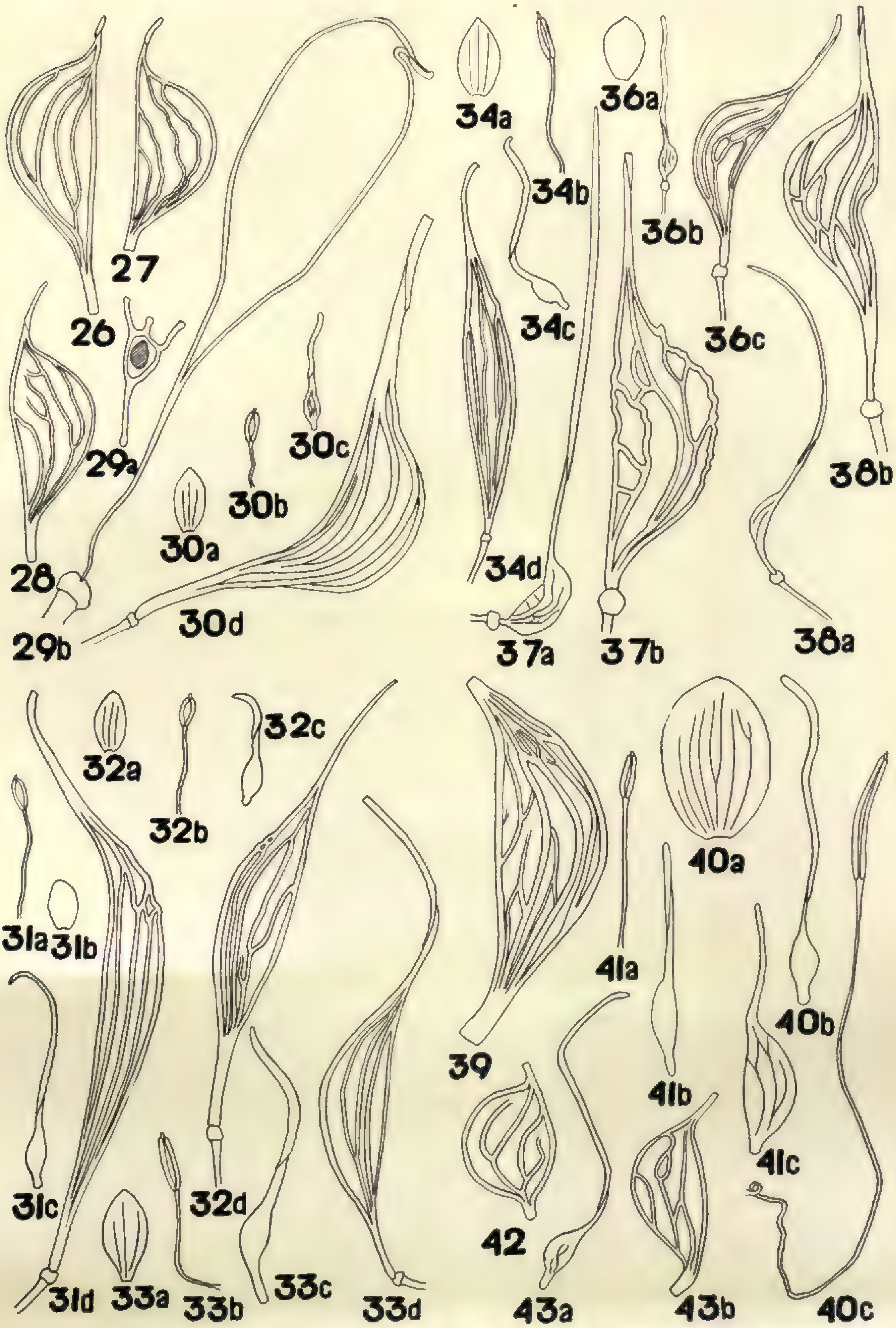
The type is at Leningrad and was collected in Dahuria by Turczaninow. Not seen. The four following varieties seem to be worth recognition, although their characters overlap to some extent and notwithstanding an occasional intermediate specimen. The latter are never hard to classify, for each variety has a clear-cut geographic distribution and no two varieties occur in the same region.

25. T. SPARSIFLORUM Turcz., var. **typicum.** *T. sparsiflorum* Turczaninow ex Fisch., Mey. & Lall. Index Sem. Hort. Petrop. **1:** 40, 1835. *T. contortum* Fischer ex Lec. Bull. Soc. Bot. Belg. **24:** 317, 1885, nomen nudum pro synon., nec *T. contortum* L. Sp. Pl. **1:** 547, 1753.—*Pedunculi* omnes ex axillis foliorum 1–3-ternatorum. *Filamenta* 4.5–6.0 mm. *Antherae* 0.8–1.0 mm. *Carpella* matura glabra ca. 8 mm. longa *stipite* ca. 1.5 mm., ventre ca. 4.5 mm. longo et ca. 2.0 mm. lato, apice acuto, *nervo* dorsali concavo.—SIBERIA, YENISSEISK: *Schipezinsky 75,* distr. Krasnojarsk, ad fl. Kas., 18 junii 1927 (NY). AMUR: *Komarov 724,* vallis Sútàr, prope stationem Liubavisky, 14 junii 1895 v. (G, NY). FIG. 25, a and b.

26. T. SPARSIFLORUM Turcz., var. **Richardsonii** (Gray), stat. nov. *T. clavatum* sensu Hooker, Fl. Bor.-Amer. **1:** 2, 1829, nec

sensu DC. Syst. **1:** 171. 1817. *T. Richardsonii* Gray, Amer. Journ. Sci. **42:** 17, 1842.—*Pedunculi* omnes ex axillis foliorum 1–3-ternatorum. *Filamenta* 3.0–4.5 mm. *Antherae* 0.5–1.0 mm. *Carpella* matura glabra 7.5–10.0 mm. longa, *stipite* 1.2–3.0 mm., ventre 4.5–6.0 mm. longo et (2.3)–2.5–(3.0) mm. lato, apice truncato, *nervo* dorsali recto vel parum convexo.—"Canada": *Franklin Expedition* (G, paratype of *T. Richardsonii*). Alberta: *Hitchcock 12,070*, Athabasca Landing, July 28, 1914 (US); *Brinkman 4169*, Slave Lake Distr., Nratauway River (Salteau), wettish spots in forest, June 6, 1929 (NY); *Richardson*, Slave Lake, Portage la Loche (G, fragment of type of *T. Richardsonii*); *Raup*, eastern edge of Caribou Mountain plateau, about 114° 9′ W., 58° 51′ N., muskeg along creek, July 12, 1930 (G). British Columbia: *Kay*, Lake Ailoknajik, 1883 (G); *McCabe 7678*, Omineca River, Germansen Landing, in boggy ground in alder, cottonwood and small spruce woods, flowers dull white, not red, July 4, 1940 (UC); *Anderson 7566A*, Hazelton, open woods, June 19, 1925 (N-ND). Yukon: *Eastwood 224*, Dawson, Bonanza Creek, June 13, 1914 (G); *Macoun 58,344*, mouth of Bonanza Creek, Aug. 11, 1902 (F, NY); *Williams*, mouth of Klondike, July 9, 1899 (NY); *Tarleton 64*, Five Finger Rapids, July 5, 1899 (NY). Alaska: *Coville & Kearney 2345*, Kodiak, July 20, 1899 (G); *Mylroie 128*, Kodiak, 1910 (NY); *E. H. & H. B. Loof 42*, Kodiak, Olga Bay, wet places in valleys, July 5, 1938 (N-ND, NY); *E. H. Loof 42*, Kodiak, Alitak, June–July, 1937 (G); *Eyerdam 19*, Kodiak, Sitkalidak Isl., Port Hobron, July 27, 1931 (NY); *Harrington 1*, Nagai I., Sanborn H., 1871–1872 (ANS, G, NY); Unalaska (NY); *Kellogg 211*, Unalaska, subalpine, 1867 (ANS, G); *McKay*, Nushagak, island above tide-water, June 25, 1881 (ANS); *Horne*, Karluk, sparse but common in rich lower banks, July, 1901 (NY); *Scamman 210*, Fairbanks, Aug. 10–20, 1936 (G); *Chapman 42*, Anvik, north end of island in Anvik River opposite mission, Aug. 15, 1906 (G); *Anderson 6654*, Hope, wet woods, June 8, 1941 (G); *Anderson 2 A 293*, Boat Harbor, Lynn Canal, in grass near beach, Aug. 11, 1925 (G); *Anderson 916*, Matanuska, July 8, 1931 (G); *Anderson 7079*, Manly Hot Springs, July 5, 1941 (G); *Mexia 2185*, McKinley National Park, hills west of Wonder Lake, in damp hollow, alt. 800 m., Aug. 4, 1928 (ANS, G, NY); *Scamman 1609*, Curry, June 12, 1940 (G); *Martel 76*, Fox Bay, stream-bank, Aug. 2, 1935 (G). Siberia, primorsk: *Eyerdam*, Kamtchatka australis, Savoiko, 29 julii, 1928 (G); idem, 31 julii 1928 (F); *Tiling*, Ajan (G).

T. Richardsonii Gray: fragment of type and a paratype at the Gray Herbarium. Hooker and Gray at first called this plant *T. clavatum* DC. Having seen true *T. clavatum* DC. during a trip in the Southern Appalachian upland, Gray proposed the name



Details of Flowers or Fruits of Thalictrum, all × 4.

(For explanation see end of paper.)

T. Richardsonii for *T. clavatum* sensu Hooker. But later on, probably after receiving a specimen of the same species from Ajan, Gray, in Pl. Wright. **2:** 8 (270), 1853, dropped *T. Richardsonii* in favor of *T. sparsiflorum* Turcz. FIG. 26.

27. T. SPARSIFLORUM Turcz., var. **saximontanum,** var. nov. *T. utahense* Greene ex Rydb., Fl. Rock. Mts., 289, 1918, nomen nudum ex synonymis.—Nonnunquam pauci *pedunculorum* ex axillis bractearum, ceteri ex axillis foliorum 1–3-ternatorum. *Filamenta* 3.5–4.5 mm. *Antherae* 0.5–1.0 mm. *Carpella* matura pubescentia 6.0–8.5 mm. longa, *stipite* (0.3)–0.5–(1.0) mm., ventre 4.0–5.5 mm. longo et (2.2)–2.5–(3.2) mm. lato, summo truncato vel obtuso, *nervo* dorsali fere recto, nervis lateralibus nonnunquam undulatis et ramosis.—MONTANA: *Rose 61*, Carbon Co., near Red Lodge (CA). IDAHO: *Eggleston 13,980*, Custer Co., Challis Forest, Morgan Creek, Taylor's ranch, ca. 1940 m., July 29, 30, 1917 (G); *E. B. & L. B. Payson 2109*, Teton Co., hills southeast of Victor, wooded creek-banks, alt. 6200 ft., July 24, 1920 (CA, G); *Macbride 593*, Elmore Co., Trinity, creek-banks, alt. 4500 ft., Aug. 12, 1910 (G); *Macbride & Payson 2945*, Blaine Co., Camas Prairie, in shade of creek-bottom, alt. 5700 ft., June 29, 1916 (G); *E. B. & L. B. Payson 2013*, Fremont Co., Henry Lake, creek-banks, alt. 6000 ft., July 14, 1920 (CA, G); *Macbride & Payson 3283*, Custer Co., Bear Creek, wet creek-banks, alt. 6000 ft., July 18, 1916 (CA, G); *Henderson 3372*, Blaine Co., near Ketchum, July 23, 1895 (CA). WYOMING: *L. Williams 1671*, Grand Teton National Park, Cascade Creek, moist bottoms, alt. 7500 ft., July 7, 1934 (CA); *L. Williams 855*, Grand Teton National Park, in timber, moist places, alt. 7000 ft., July 14, 1932 (CA, G); *A. & E. Nelson 6364*, Yellowstone Park, Lewis River, on the banks of the river, Aug. 8, 1899 (G, TYPE of var. *saximontanum*); *L. O. & R. Williams 3186*, Big Horn Co., Shell Creek, near the mouth of Antelope Creek, sandy rocky creek-bottom, alt. 8500 ft., June 30, 1936 (G); *A. Nelson 7970*, Albany Co., Little Laramie, Middle Fork, in wet willow thickets, very common, Aug. 6, 1900 (G); *Goodding 408*, Big Horn Co., Ten Sleep Creek, shaded creek-banks, July 30, 1901 (G); *Merrill & Wilcox 913*, Lincoln Co., Leighs Lake, Jacksons Hole, damp soil, July 24, 1901 (G); *A. Nelson 1548*, Cummins, alt. 8000 ft., July 30, 1895 (G); *A. Nelson 1494*, Cummins, July 29, 1895 (G). COLORADO: *Parry 76*, from the headwaters of Clear Creek and the alpine ridges lying east of Middle Park, 1861 (G); *Parry 9*, Rocky Mountain Flora, 39°–41°, 1862 (US); *Parry 76*, 39°–41°, alpine and subalpine, 1862 (G); *Hall & Harbour 9*, Rocky Mts., alpine, 39°–41°, 1868 (G); *Vasey 7, 9*, Rocky Mts., Grand Lake, 40°–41°, 1868 (G, US); *Zobel*, Middle St. Vrain River, July 12, 1939 (CA); *Hapeman*, Poudre Canyon,

alt. 7500 ft., Aug. 24, 1936 (CA); *Walker 478*, San Miguel Co., Norwood Hill, moist north slope by river, alt. 7000 ft., Aug. 17, 1912 (G); *Crandall 33*, near Georgetown, along stream, alt. 847.4 ft. [sic], July 20, 1892 (G); *Churchill*, Clear Creek Co., Brookvale, Yankee Creek, thicket, June 22, 1918 (G); *Patterson*, vicinity of Georgetown, Bard Creek near Empire, June 28–Aug. 7, 1875 (F). UTAH: *M. E. Jones 5731a, 5731b*, Sevier Co., Fish Lake, alt. 9000 ft., Aug. 3, 1894 (US); idem *5789*, Aug. 6–7 (NY, US); *E. B. & L. B. Payson 4970*, Summit Co., Uintah Mts., Stillwater Fork of Bear River, in deep shade near stream-bank, alt. 8800 ft., July 15, 1926 (G); *Goodman & Hitchcock 1482*, Summit Co., Uintah Mts., E. Fork of Bear River, meadow, edge of small stream, alt. 8900 ft., July 9–13, 1930 (G); *Graham 10,087*, Uintah Co., between Paradise Park and Chepeta Lakes, lodgepole-spruce woods, along stream, alt. 10,300 ft., Aug. 20, 1935 (G). OREGON: *Cusick 3357a*, Wallowa Mts., in a swamp of North Catherine Creek, very rare, alt. about 4500 ft., Aug. 31, 1910 (G). FIG. 27.

28. T. SPARSIFLORUM Turcz., var. **nevadense,** var. nov. *Pedunculi* nonnunquam pauci ex axillis bractearum, plurimi vel omnes ex axillis foliorum 1–3-ternatorum. *Filamenta* ca. 4 mm. *Antherae* 0.7–1.0 mm. *Carpella* matura pubescentia 7.5–8.0 mm., *stipite* millimetri, ventre 4.5–6.0 mm. longo, 2.2–2.5 mm. lato, summo rotundo vel obtuso, *nervo* dorsali convexo vel summo convexo et basi concavo.—NEVADA, ESMERALDA: *Duran 3354*, White Mountains, Trail Canyon, alt. 9800 ft., July 20, 1932 (CA, G, UC). CALIFORNIA: *Lemmon*, Webber Lake, Oct., 1890 (UC); *Campbell*, Kearsarge Pass, on east side, July 29, 1916 (CA); *Michaele*, Yosemite, Pohono trail, July 19, 1922 (CA); *Redfield*, prope lacus Tahoe, in paludibus, Sept. 1, 1872 (M). CALIFORNIA, LASSEN: *Nutting & Baker*, Pine Creek, July 12, 1894 (UC). SHASTA: *Eastwood 1913*, Lassen Butte region, Battle Creek meadows, Aug. 22–26, 1912 (G, M, UC); *Austin*, Big Spring, 4–6 ft. high, weak, supported by bushes, July 4, 1878 (G); *Brown 610½*, near Lassen Buttes, alt. 6000 ft., Aug. 1–15, 1897 (M); *Austin*, near Lassen Peak, Warner Valley, 1879 (G). BUTTE: *Copeland*, Jonesville, above Butte Creek House, alt. 1800 m., Aug. 26, 1930 (UC). SIERRA: *Sonne*, Little Truckee River, fls. July 10, 1892, fr. Aug. 7, 1892 (UC). NEVADA: *Heller 7056*, on the Truckee River, one mile above Truckee, July 30, 1903 (G, TYPE; M, UC, ISOTYPES). PLACER: *Sonne*, road to Hot Springs, fl. June, 1896, fr. July, 1896 (NY). ELDORADO: *Hillman*, Lake Tahoe, Bijou, Sept. 15, 1894 (UC); *Crum 3011*, two miles southeast of Echo Lake, Echo Summit, alt. 7500 ft., subalpine zone, wet soil, shade, July 3, 1939 (UC). TUOLUMNE: *Mason 680*, Sierra Nevada Mts., Lyell Fork, Aug. 1, 1923 (UC). MARIPOSA: *Babcock 281* (*1097*), Yosemite Nat.

Park, Illilouette Canon, on first branch of Illilouette Creek, above the falls, growing in bogs, abundant here but apparently not common in the middle Sierra Nevada, alt. 1955 m., June 28, 1912 (CA, G, M, UC). MONO: *Wright*, Mono Lake, July 18, 1917 (CA). MADERA: *Congdon*, Upper San Joaquin, Aug. 19, 1895 (UC). FRESNO: *Hall & Chandler 142*, Pine Ridge, alt. 5300 ft., June 15–25, 1900 (UC). INYO: *Rose 35,462*, Ibex Park, E. slope, meadows, alt. 10,300 ft., July 24, 1935 (CA); *Peirson*, Rock Creek Lake Basin, margin of lake on east side of canyon and at base of Transverse Ridge, alt. 10,700 ft., Aug. 5, 1940 (UC); *Peirson*, Rock Creek Lake Basin, near Ruby Falls, in wet locations, alt. 10,900 ft., Aug. 19, 1933 (UC); *Alexander & Kellogg 2581*, Big Pine Creek, trail between 2nd and 3rd lakes, in rank vegetation near small creek, July 16, 1941 (UC); *Halperin 579A*, Rock Creek, alt. 10,000 ft., July 31, 1932 (CA); *Ferris 8866*, Loch Leven Fork of Bishop Creek above North Lake, dry slopes in lodgepole pine forest, July 21, 1934 (UC). TULARE: *Hopping 352*, Kaweah River Basin, Round Meadow, Sept. 16, 1905 (UC); *Hopping 376*, Kaweah River Basin, Giant Forest, July 20, 1904 (UC); *J. T. Howell 17,513*, Chagoopa Plateau, Sky Parlor Meadow, Aug. 1, 1942 (CA); *J. T. Howell, 15,700*, East Lake, July 30, 1940 (CA); *Cronquist 2132-A*, Sequoia Nat. Park, 3 miles from Giant Forest, Crescent Meadow, alt. about 7000 ft., June 27, 1940 (M). SAN BERNARDINO: *L. C. Wheeler 1186*, San Bernardino Mts., S. Fork Santa Ana R., sunny stream-side, alt. 8400 ft., Aug. 21, 1932 (CA); *Abrams 2842*, San Bernardino Mts., Bear Valley, alt. 6700 ft., Aug. 1, 1902 (G, M); *Abrams & McGregor 765*, San Gorgonio Mt., Dollar Lake Canyon, alt. 9000–9500 ft., July 12, 1908 (G); *S. B. & W. F. Parish 1484*, San B. Mts., Bear Valley, Aug., 1882 (G); *Munz 12,676*, San B. Mts., South Fork of Santa Ana River, in meadow, about willows, etc., foetid plant, alt. 8300 ft., Aug. 21, 1932 (M, UC); *Munz 10,617*, San B. Mts., Bluff Lake Meadow, shade of willows, with foetid odor, alt. 7400 ft., July 5, 1926 (UC); *Munz 6267*, San B. Mts., So. Fk. of Santa Ana, common in wet meadows, alt. 8000 ft., Aug. 25, 1922 (UC); *M. E. Jones*, San B. Mts., Bear Valley, alt. 6600 ft., July 19, 1900 (CA, UC); *Johnston*, San B. Mts., Bluff Lake, shaded margin of meadow, alt. 7500 ft., July 5, 1924 (G); *J. T. Howell 2760*, San B. Mts., Riverside Municipal Camp, Mill Creek Road, moist partially shaded stream-bank, alt. 7300 ft., July 10, 1927 (CA); *Grant 1287a–6351*, San Gorgonio Mt., July 24, 1904 (CA, UC); *Anderson*, grade south of Bear Lake, moist soil, alt. 7000 ft., July 24, 1935 (C-UC). RIVERSIDE: *Spencer 2259*, San Jacinto Mt., in sylvis, alt. 6000 ft., julio, 1923 (G). OREGON, KLAMATH: *Thompson 12,322*, Crater Nat. Park, along Annie Creek, under shade, alt. 5000 ft., July 26, 1935 (CA, G, NY). FIG. 28.

Sectio Tripetrium DC. Syst. **1:** 169, 1817. *Tripetrium* (DC.) Bercht. & Presl, O Priroz. Rostl. **1:** 14, 1823. Subg. *Tripetrium* (DC.) Reich. Cons. Regn. Veg. 192, 1828. *Ruprechtia* Opiz, Sez. Rost. Kve. 86, 1852.—*Filamenta* staminum dilatata. *Carpella* matura valde tri-quadrialata, longe stipitata, *rostro* ad ventrum deflexo. *Stigma* brevius. Species typica *Thalictrum aquilegifolium* L. sit.

All names proposed for this group are clearly based on *T. aquilegifolium* L. De Candolle himself included two species in this section, and one of the two may be a synonym of *T. aquilegifolium* L. This species was also proposed as a standard species for the genus *Thalictrum*, but there was an earlier and better proposal: *T. foetidum* L. (See p. 347 for discussion of this topic). This section is not represented in America.

29. T. aquilegifolium L., var. typicum Beck, f. **Cornuti** (L.), stat. nov. *T. Cornuti* L., Sp. Pl., **1:** 545, 1753. *T. canadense* Miller, Gardener's Dict. ed. 8, 1768. *T. confertum* Moench, Hort. Marburgensis, 297, 1794. *Leucocoma canadensis* (Miller) Nieuwland, Amer. Midl. Nat. **3:** 254, 1914.—A varietate typica differt filamentis staminum albis. Type, not seen, in the herbarium of Clifford at the British Museum of Natural History. Fig. 29, a and b.

There is in America no species corresponding to Cornut's description, and the plant is not represented in the Linnaean Herbarium, Lecoyer, however, saw the specimens under that name in the herbaria of the Hortus Cliffortianus, of Vaillant, of Tournefort and of the Academy of St. Petersburg, and states that they all belong to *T. aquilegifolium* L. Thus it seems that the plant cultivated by Cornut was later widely distributed in European botanical gardens and, although he left no herbarium specimens, we still have good material by which to interpret what he meant. But this has been strongly contested by many authors.

In 1635, when Cornut published his *Thalictrum canadense*, Canada had been explored from the Gulf of Saint Lawrence to the Great Lakes, a region where six species grow: *T. alpinum* L., *T. polygamum* Muhl., *T. dasycarpum* Fisch. & Lall., *T. revolutum* DC., *T. confine* Fern. and *T. dioicum* L.

If one reads Cornut's description he will see that the height of the plant (bicubitalis) eliminated *T. alpinum* L. The color of the stamens (mille alba filamenta ostendunt) eliminated *T.*

alpinum, *T. confine* and *T. dioicum*. The number of sepals per flower (singuli in quinque folia divisi) eliminated all but *T. alpinum*. The flowering time (julio mense singula filamenta dum deficiunt) eliminated *T. polygamum*, *T. revolutum* and *T. dasycarpum*. And the form of the fruit (triangularisque formae, extante quadam per singulos angulos epiphysi membranea) not only eliminated all six species but sufficed alone to characterize *T. aquilegifolium* L.

If we now turn to Cornut's plate, the stipellules, which are very clearly represented indeed, eliminate all eastern North American species. But the habit and the flowers suggest *T. polygamum*. The habit and the flowers also suggest *T. aquilegifolium* as well. It is true that the latter has perfect flowers and there is not a word about the ovaries in the text nor are they represented in the drawing. But anyone who has seen *T. aquilegifolium* L. in bloom has not seen any ovary unless he suspected their presence and carefully dissected a flower. For the ovaries are few, filiform, very small and hidden in the middle of the flower amidst the bases of the stamens. If anyone sees the plant in bloom and comes back to it a week or two later to find no trace of the stamens but only already well developed fruits, he will certainly get the impression which Cornut seems to have intended the following words to convey: "julio mense singula filamenta dum deficiunt, in totidem semina degenerant".

De Candolle first seems to have realized this error and he proposed *T. corynellum* for the American plant hitherto called *T. Cornuti* L. In 1910, Greene[1] protested against dropping Linnaeus' name to replace it by the very ambiguous one coined by Muhlenberg. He suggested that Cornut might have received his material through Dr. M. Sarrazin and, by mistake, described the flowers of *T. polygamum* but the fruits of *T. aquilegifolium*. This point of view was endorsed by Farwell[2] and others.

As pointed out above, not only the fruits, but also the flowers and the foliage of *T. canadense* Corn. differ from those of *T. polygamum* Muhl. And Dr. Sarrazin's manuscript, a copy of which is preserved at Saint-Hyacinthe near Montréal, reads as follows:

[1] Leaflets, **1**: 51, 1910.
[2] Papers Mich. Acad. Sci. **26**: 10, 1941.

178 Thalictrum Canadence, caule purpurascente, aquilagiae foliis, florum staminibus albis I.R.H. 271. Canadense Corn. 186.
Il croît sur les bords des rivières, dans les prairies.

Cornut having written in 1635, this point needs no further discussion. Indeed, Dr. Sarrazin lived from 1659 to 1734.

Greene also suggested that, Cornut's plant having been described from cultivated material, it might be possible to find it in European botanical gardens. Well, what Linnaeus, Tournefort and Vaillant had and called *T. canadense* Corn. was *T. aquilegifolium* L., but Bernard de Jussieu had in his herbarium both *T. aquilegifolium* L. and *T. polygamum* Muhl. labelled *T. canadense* Corn.

T. canadense Miller. The intention of Miller was certainly not to describe a new species, for he calls it *T. canadense* Cornut. Only through the rules of nomenclature is this name attributed to Miller.

Thalictrum confertum Moench. Described from plants cultivated in a botanical garden, no type being known to exist. Moench gives *T. Cornuti* L. as a synonym and his description agrees perfectly well with *T. aquilegifolium* L. in bloom.

Thus it seems probable that, through exchanges between botanical gardens, the stock of seeds which furnished *T. Cornuti* L. also furnished *T. canadense* Miller and *T. confertum* Moench. At any rate, it seems to be the only sensible explanation.

In his herbarium, now at the Smithsonian Institution, Mohr had a small fragment of *T. aquilegifolium* L. purportedly collected by Prof. Riddell in 1839 in Ohio and it was identified as *Thalictrum dioicum* L., var. *stipitatum* T. & Gr. Undoubtedly it was from cultivated plants.

(*To be continued*)

THE IDENTITIES OF EPILOBIUM LINEARE, E. DENSUM AND E. CILIATUM

M. L. Fernald

The names, *Epilobium lineare* Muhl., *E. strictum* Muhl., *E. densum* Raf. and *E. molle* Torrey, are so familiar and have been so generally used (ordinarily *E. lineare* and *E. densum* united as

one, *E. strictum* and *E. molle* as a second species) that it comes as a shock to find how easily they have been taken up, but how little attention has been paid to their actual applications and to the original descriptions. In eastern North America we have 5 species definitely belonging in Haussknecht's Series *Palustriformes*, and a 6th which he places there but which is surely atypical of that alliance. In order that the following analysis may be less obscure these species may be briefly defined as follows:

a. Stem, leaves and capsule grayish-velvety with short horizontally divergent pubescence; stem bearing numerous axillary fascicles of leaves; leaves oblong-lanceolate to linear, obtuse to subacute, not attenuate at tip; petals pink, 7–9 mm. long; Gaspé Peninsula, Quebec, to Minnesota, south to Nova Scotia, New England, northern Virginia, northern Ohio, central Indiana and northern Illinois.
1. *E. strictum* Muhl. (1813), *E. densum* Raf. (1814), *E. molle* Torr. (1824) not Lam. (1778).

a. Stem, leaves and capsule glabrous to minutely incurved-pubescent....*b.*

b. Median and upper cauline leaves linear to lanceolate, the larger ones of each plant 1–10 cm. long; calyx-segments tapering to acute or subacute tips; seed with short and thick to barely evident neck....*c.*

c. Leaves closely and evenly pubescent (seen under magnification) above with minute incurved hairs, tapering or attenuate to tip; tips of stem or branches and buds before flowering arching or ascending, not strongly nodding....*d.*

d. Stem freely upright-branching to simple, arising from a fibrous-rooting usually nonstoloniferous base; calyx 3–4.5 mm. high; petals 4–6.5 mm. long; seeds tapering to evident collar or neck; Gaspé Peninsula, Quebec, to Alberta, south to Nova Scotia, New England, Delaware, Maryland, West Virginia, Ohio, Indiana, Illinois, Missouri, Kansas and Colorado.
2. *E. rosmarinifolium* Pursh (1814) not Haenke (1788), *E. leptophyllum* Raf. (1814), *E. tenellum* Raf. (1814), *E. lineare*, sensu Barton (1818) as to plant described, not Muhl. (1813 as based nomenclaturally on *E. oliganthum* Michx.), *E. squamatum* Nutt. (1818).

d. Stem simple (except for axillary fascicles) or with few erect branches, arising from decumbent prolonged and rooting simple base or from loosened scaly bulbs, propagating by elongate filiform stolons with terminal bulbs; calyx 4.5–7 mm. high; petals 7.5–10 mm. long; seeds essentially without collar; Newfoundland, Anticosti, Magdalen Islands and Sable Island
3. *E. nesophilum* Fernald (1925).

c. Leaves glabrous above or with few remote hairs; tips of stems and pedicels before flowering nodding....*e.*

e. Flowering stems arising from tips of slender stolons of the preceding year or from loosened scaly bulbs, late in the season sending out filiform stolons; uppermost internodes and capsules, if pubescent, uni-

formly so; margins of leaves entire or very shallowly undulate, revolute, the leaf-tips acute to obtuse; calyx sparsely pubescent; circumpolar boreal species, the var. *oliganthum* Haussk. with thick strongly appressed-ascending obtuse linear leaves coming south to Newfoundland, Nova Scotia, eastern Massachusetts, Rhode Island, central New York, etc.,. . .4. *E. palustre* L.; var. *oliganthum*, *E. oliganthum* Michx. (1803) "ad sinum *Hudsonis* et lacus *Mistassins*." *E. lineare* Muhl. (1813), the name at least an illegitimate substitute for *E. oliganthum* Michx.

e. Flowering stems arising from basal rosettes of round-tipped leaves, without stolons; internodes and capsule glabrous except for restricted lines of hair; leaves round-tipped, with flat ciliate denticulate margins; calyx glabrous; circumpolar, coming south with us to northern Newfoundland, Anticosti and shores of James Bay. .5. *E. davuricum* Fisch. (1819).

b. Median and upper cauline leaves elliptic-oblong, obtuse or round-tipped, 0.8–2 cm. long; calyx-segments oblong, broadly rounded at tip; seed with long slender neck; endemic in Newfoundland. . . . . .6. *E. Pylaieanum* Fernald (1925).

In the study of the relatively southern species of Muhlenberg, Rafinesque and Torrey species nos. 3, 5 and 6 of the preceding key may safely be omitted. The earliest published name in the remaining series was *E. oliganthum* Michx. Fl. Bor.-Am. i. 223 (1803).

OLIGANTHUM. E. pusillum: caulibus simplicissimis, apice subunifloris: foliis oppositis, linearibus, integerrimis.
Obs. Idem in Pyraeneis lectum vidi.
Hab. ad sinum *Hudsonis* et lacus *Mistassins.*

The type, studied by me in 1903 and of which a very clear photograph is before me, was originally called *E. palustre*, that name then crossed out and *oliganthum* substituted. The locality is given as "Env. de Mistassin" and a diagnosis on the label reads "fol. opp. lineari-lanceolatis obtusis. florib. duobus in summo caul. Stam. erectis." There are two simple fruiting plants, showing the characteristic remnants of short and thick bulb-scales along the slender creeping base. As shown by my study of the actual specimens, the erect and obtuse leaves are glabrous; and as the photograph shows, the filiform pedicels are toward twice the length of the short capsule. In other words, the type of *E. oliganthum* is the best kind of *E. palustre*, var. *oliganthum*[1], the North American plant has erroneously passed as var. *monticola* Haussk. of continental Europe.

[1] E. PALUSTRE L., var. **oliganthum**, comb. nov. *E. oliganthum* Michx. Fl. Bor.-Am. i. 223 (1803). *E. lineare*, var. *oliganthum* (Michx.) Trelease in Mo. Bot. Gard. 2nd Ann. Rep. 88 (1891), as to basonym only.

Epilobium lineare Muhl. Cat. 39 (1813), with the only distinctive item, "linear-leaved," a literal translation of the specific name, has been regularly treated as a *nomen nudum* (with no nomenclatural status), but validated through the good description published by Barton, Comp. Fl. Philad. i. 183 (1818), Barton giving in synonymy not only the wholly different *E. oliganthum* Michx., but the specifically identical *E. rosmarinifolium* Pursh (1814) and *E. squamatum* Nutt. (1818). There is no question about what Barton described nor, it is admitted, what Muhlenberg would have described if he had given a description. The difficulty centers on Muhlenberg's citation as identical with his otherwise undefined *E. lineare* of Michaux's species of 1803. Here are Muhlenberg's treatments, first in 1813:

Corolla				
alb.	4. lineare	♃	linear-leaved	Penns. fl. July–Sept.
	oliganthum	Mx.		Virg.

and in the 2nd edition (1818)

alb.-ros.	4 lineare	♃	linear-leaved	Pens. fl. Jul–Sept. Vir.
	oliganthum,	Mx.		N. Angl.

Even though the plant of Pennsylvania, Virginia, etc. is not at all *E. oliganthum* Michx., Muhlenberg thought that it was and so did Barton when he gave the description of the plant of "boggy grounds and low meadows, common", in his Compendium Florae Philadelphicae. There already being a name, *E. oliganthum*, which they both considered identical with *E. lineare*,

When Trelease published *E. lineare*, var. *oliganthum* for "(*E. oliganthum*, Michx. in part), of the middle Atlantic region" he implied that Michaux had two different plants under that name. Michaux's description and his type from near Lake Mistassini afford no justification for such an assumption. Var. *oliganthum* is the plant which has erroneously passed in America as *E. palustre*, var. *monticola* Hausskn. This misinterpretation of Haussknecht's variety, found "in der montanen und alpinen Region" of Europe, arose through his statement (Mon. Gatt. Epilob. 131) under var. *monticola* that it "liegt im . . . Hb. Kunth als E. oliganthum von Michaux aus Nord Amerika." Americans, grasping hopefully at any straw, have accepted the name var. *monticola* for our plant. Haussknecht's description, however, called for crowded and rigid leaves greatly prolonged at tip and violet flowers 7 mm. long ("foliis m. m. conferte dispositis, crassiusculis, rigidis, . . . apice magis productis obtusis . . . ; flor. violaceis, 7 m. m. longis"). Just such a specimen, with rigid and closely overlapping appressed leaves, with prolonged tips, and with the relatively showy flower 7 mm. long, is before me, from Saxony. In var. *oliganthum* the leaves are thickish but not rigid, the subdistant pairs ascending but not imbricated and they are not conspicuously prolonged at tip. The white to pale pink flower of our plant is 4–6 (very rarely –8) mm. long.

they should have used that. The name *E. lineare* was, from the first, and emphatically as used by Muhlenberg, illegitimate, because a substitute for a validly published and legitimate earlier name.

Not so with the next publication, by Pursh, Fl. Am. Sept. i. 259, ii. 747 (1814). Pursh clearly described the plant which has commonly passed as *E. lineare* or as *E. densum* Raf. as *E. rosmarinifolium*, with the doubtful synonym *E. oliganthum* Michx. Since Pursh did not positively identify his species as that of Michaux, his name was legitimate but, unfortunately, superseded by the same name for a different species of Haenke (1788).

In the same year Rafinesque, Précis des Découv. 41 (1814) described the plant, presumably of Muhlenberg and obviously of Pursh and of Barton. The only discrepancy is his characterization of the leaves as "glabres", but, since he was contrasting his *E. leptophyllum* and its more simple state, *E. tenellum*, with the positively soft-pubescent *E. densum* Raf. l. c. 42 (1814) that was a natural enough error if he did not magnify the upper leaf-surfaces. *E. leptophyllum* of "la Pensylvanie et le Maryland, dans les bois humides" with "Tige rameuse, un peu scabre; feuilles alternes, presque sessiles, linéaires, etroites entières, glabres, uninervées aigues à base retrécie" was (with apologies for "glabres") a good description of the common almost transcontinental plant.

As to *Epilobium densum* Raf., the name was taken up in place of the illegitimate *E. lineare* on the authority of Trelease, Rev. Epil., Mo. Bot. Gard. 2d Ann. Rep. 88 (1891). At that place Trelease wrote:

"If the custom of replacing Mullenberg's names, owing to incomplete description, should ever become prevalent, the very descriptive name *E. densum*, Raf. Desv. Journ. de Bot. ii. (1814), 271, may come to replace the one here employed for this species." Fortunately the rejecting of Muhlenberg's *nomina nuda* and illegitimate names is a matter of law, rather than of "custom"; unfortunately, Trelease's identification of *E. densum* was accepted at its face value, for it is quite clear that Rafinesque was well describing the soft-pubescent *E. strictum* Muhl. (1813). Of that more later.

In summary of the first matter, it seems that for the plant which has borne the illegitimate name *Epilobium lineare* Muhl. and the quite inapplicable *E. densum* Raf. the only available names are E. leptophyllum Raf. Précis des Découv. 41 (1814) and *E. tenellum* Raf. l. c. Since the latter was evidently a mere slender and simple state of the former, I am taking up the name of the characteristically branching plant.

Species no. 1, *Epilobium strictum* Muhl. (*E. molle* Torr., not Lam.) is distinguished from all other eastern American members of the *Palustriformes* by the nearly uniform soft and almost plush-like spreading pubescence which covers the internodes, leaves, pedicels and capsules; and from *E. leptophyllum* (with linear or linear-lanceolate leaves long-attenuate) by its tendency to oblong-lanceolate, or even narrowly oblong or linear, blunt or bluntish leaves, as well as by its much larger flowers. When, therefore, Trelease, in the passage above quoted, identified with his *E. lineare* the *E. densum* Raf., he could not have studied very closely Rafinesque's description of the latter. Most unfortunately, as already noted, those of us who accepted on faith this identification and took up the name *E. densum* for *E. lineare* of authors, clearly went astray. Trelease, l. c. definitely distinguished the two species, *E. strictum* and *E. lineare:* the former "Pubescent throughout with soft spreading hairs; leaves . . . rather obtuse, with evident lateral veins", etc., his key saying "leaves . . . sessile"; the latter "Canescent . . . with incurved hairs; leaves linear-lanceolate, acute, without evident lateral veins", the key adding "petioled". That Rafinesque, after well describing *E. leptophyllum,* with 1-nerved linear acute leaves narrowed to base, gave for his *E. densum* a superior account of *E. strictum* (compare Trelease's account of the latter) is evident from his two descriptions. The first was in his Précis des Découvertes, 42 (1814), one of his four species from "la Pensylvanie et le Maryland, dans les bois humides":

138. *Epilobium densum.* Entièrement pubescente, feuilles éparses rapprochées, sessiles, linéaires-lancéolées, presqu' obtuses, entières, nerveuses; fleurs paniculées, pedunculées, à bractées oblongues."

Slightly later, in Desv. Journ. de Bot. vi. 271 (1814), essentially the same description was given.

If the name *Epilobium strictum* Muhl. Cat. 39 (1813) be

treated, as is done by Haussknecht, by Trelease and by Index Kewensis, as not properly applying to anything until validated through a good description in Sprengel, Syst. ii. 233 (1825), then we must take up the name *E. densum* Raf. (1814) for that very definite species. In this case, however, it seems to me that Muhlenberg barely "got through by the skin of his teeth", definitely enough so that his *E. strictum* of the Catalogus (1813) may legitimately be accepted. Whereas under his *E. lineare* he clearly stated that it was the same as an earlier described species of Michaux and gave no word which can be taken as diagnostic, in the case of *E. strictum* he gave the all-important distinctive adjective:

Corolla			
rubel	3. strictum	upright, (soft)	Penns. fl. Sept.

That single word *soft* "does the trick"; it is the most striking character. I am, therefore, supporting *E. strictum* Muhl. (1813) as barely but definitely described. The name *E. molle* Torr. being a later homonym, we must drop that.

The following minor transfers in the *Palustriformes* have to be made:

Epilobium leptophyllum Raf., forma **umbrosum** (Haussk.), comb. nov. *E. lineare,* forma *umbrosum* Haussk. Mon. Gat. Epilob. 255 (1884).

E. nesophilum Fernald, var. **sabulonense** (Fernald), comb. nov. *E. molle,* var. *sabulonense* Fernald in Rhodora, xx. 31 (1918).

Epilobium ciliatum Raf.—Only three species of *Epilobium* of Haussknecht's series *Tetragonoideae* are found in the North Atlantic States: *E. coloratum* Biehler (1807); *E. adenocaulon* Haussk. (1879), which I consider a variety of *E. glandulosum* Lehm. (1830), i. e. *E. glandulosum,* var. *adenocaulon* (Haussk.) Fernald in Rhodora, xx. 35 (1918); and the little plant which was described as *E. americanum* Haussk. in Oestr. Bot. Zeitschr. xxix. 118 (1879), the plant later called *E. adenocaulon,* var. ? *perplexans* Trel. Mo. Bot. Gard., 2nd. Ann. Rep. 96 (1891) and *E. glandulosum,* var. *perplexans* (Trel.) Fernald, l. c. (1918). *E. coloratum* stands apart by its rugulose-veiny narrowly lanceolate grayish-green leaves with 35–75 or more serrulations on each margin, by the cinnamon-brown coma and the broadly

rounded summit of the essentially neckless seed. The other two have more ovate, elliptic or ovate-lanceolate non-rugose and bright green leaves with fewer teeth, the coma whitish and the seed with a definite short neck. *E. glandulosum* (typical) is boreal, in the East chiefly on the coasts of Labrador, Newfoundland and Quebec, while var. *adenocaulon* is wide-spread as far south as Delaware, Pennsylvania, West Virginia, etc., passing too freely into the narrower-leaved var. *occidentale* (Trel.) Fern. (*E. occidentale* (Trel.) Rydb.).

But the little plant described by Haussknecht as *Epilobium americanum*, by Trelease as *E. adenocaulon*, var. ? *perplexans*, by me as *E. glandulosum*, var. *perplexans*, and by Trelease ex Coult. & Nels. Man. Bot. Centr. Rocky Mts. 337 (1909) as *E. perplexans*, and extending south to Nova Scotia, New England, Pennsylvania, southern Ontario, Wisconsin, New Mexico, etc., seems to have some very real characters, as characters go in *Epilobium*. *E. glandulosum* (including *E. adenocaulon*, *E. occidentale*, and several so-called species farther north and west) is commonly an erect, stoutish plant up to 1 m. high, with all but the rameal and sometimes the uppermost leaves opposite, firm, deep green, with lateral nerves prominent beneath, sessile or very short-petioled, lanceolate, oblong or ovate, broadly rounded to cordate at base; the flowers up to 9 mm. long, with closely grayish-pilose calyx and lilac or purple petals; the erect fruiting pedicels 0.2–1.5 cm. long; the fulvous seed with a rather persistent coma. *E. americanum*, on the other hand, is a weak, slender and chiefly simple-stemmed plant mostly 0.3–2 (rarely –4) dm. high or long; leaves pale green, thin or flaccid, oval, elliptic or narrowly ovate, with very delicate or weak lateral nerves, the upper and often all scattered and alternate, only 1–5 cm. long, tapering to slender petioles 2–10 mm. long; flowers only 3–6 mm. high, with sparsely pilose calyx and with white or pale petals; fruiting pedicels arching to ascending, 0.5–3 cm. long; seed fulvous to fuscous, with more prominent rows of deltoid subacute papillae than in the rounded-papillate seed of the former, the coma caducous (absent from fully ripe seed).

There seems good reason to consider the little *Epilobium americanum* a distinct species. Many field-botanists have protested its merging with the others. But, apparently, the name

E. americanum is antedated by *E. ciliatum* Rafinesque in Med. Repos. N. Y. hex. II. v. 361 (1808). Rafinesque's diagnosis was brief but it emphasized the simple stem, "ovated" leaf and its petiole:

27. Epilobium ciliatum, ciliated epiloby; stem simple, leaves petiolated, ovated, ciliated, acute; flowers axillary, longer than the leaves. It grows in North Pennsylvania.

This diagnosis has to be taken into account and, as stated, it seems to have been based on the little plant described by Haussknecht as *E. americanum:* "E. herbaceum pumilum . . . *Caule* tenero . . . dodrantali . . . *Foliis* parvis ovato-lanceolatis, . . . 2–3 c. m. longis, . . . pallide viridibus, flaccidis, . . . subintegerrimis v. denticulis callosis minimis valde remotis . . . , in petiolum angustatis, superioribus . . . alternis . . . *Calyc. laciniis* . . . glabrescentibus; . . . pedicellis . . . ½–1 cm. longis."

Rafinesque was not famed for extreme carefulness and Elias Durand, who had many of Rafinesque's specimens, which he eventually took back to Paris, where they are now preserved, was notoriously careless in confusing specimens and labels. Every one who has to deal with plants received from Durand has learned to be cautious, lest the wrong label may be attached. In his Précis des Découvertes, 41 (1814) Rafinesque described his *Epilobium tenellum* with "feuilles opposées, glabres, sessiles, linéaires-étroites, entières, aigues, uninervées"; this, as noted on p. 381, is obviously the slender and subsimple state of his *E. leptophyllum.* It certainly had nothing to do with his earlier published *E. ciliatum,* with "leaves petiolated, ovated". Remembering the ease with which labels become transferred in handling loose specimens and in mounting, it is significant that, after his description of *E. americanum* in his Monographie der Gattung Epilobium, 260 (1884), Haussknecht said "Im Hb. mus. Par. liegen kleine, aus Samen entstandene Exemplare dieser Art, welche bezeichnet sind 'E. tenellum Rafin. Mts. Catshill, Et. Un. leg. Rafinesque', dessen Beschreibung jedoch durchaus nicht damit übereinstimmt."

Similarly Trelease, l. c. 94, said under *Epilobium americanum:* "According to Haussknecht, small plants of *Americanum* occur in the herbarium of the Museum at Paris. . . . . Such speci-

mens seem to come very near what I regard as a very dwarf . . . form of *adenocaulon*, . . . which may be the *E. ciliatum* of Rafinesque. . . . As yet, however, there is too much uncertainty about the matter to warrant the application of the name *ciliatum* to either plant, unless for this dwarf form (Plate 22) [small *E. adenocaulon*] either as a variety under *adenocaulon* or as a valid species immediately preceding it." In the Gray Herbarium, however, Trelease annotated as presumably *E. ciliatum* (cliffs of Saguenay River, Aug. 13, 1879, *Pringle;* Rocky Mts., *Bourgeau*, 1858) characteristic plants of his *E. adenocaulon*, var. ? *perplexans.* The latter name was well chosen. Since, however, we can scarcely reject the name *E. ciliatum* Raf. for a plant with simple stem and leaves "petiolated, ovated", and since both Haussknecht and Trelease have felt that he had *E. americanum,* I am following this interpretation. Otherwise the only plant of "North Pennsylvania" with "ovated" leaves would be *E. adenocaulon,* which is a wide-ranging variety of *E. glandulosum* Lehm. (1830). To take up *E. ciliatum* (1808) for one of the varieties of *E. glandulosum* (1830), which, as interpreted by Munz, M. E. Peck or myself, includes as varieties not only *E. adenocaulon* (1879) but *E. exaltatum* Drew (1889), *E. occidentale* (Trel.) Rydb. (1900) and *E. cinerascens* Piper (1918) and most plants erroneously identified as *E. boreale* Haussk. (1884), would create nomenclatural havoc. It is better, in the absence of an actual type, to let the earliest name, *E. ciliatum,* apply to the less variable species, to which its brief diagnosis well applies.

An Alopecurus New to North America.—On the 21st of July, 1943, while travelling through the Codroy Valley, in Southwestern Newfoundland, I plucked a couple of specimens of what I thought to be *Alopecurus pratensis* growing in an old meadow at Upper Ferry, to demonstrate to a number of farmers how to distinguish between meadow foxtail and timothy. Upon examination, however, I noted that the specimens I held in my hand differed from the typical *A. pratensis* which ranges widely throughout Eastern Newfoundland, insomuch as the awns scarcely extended beyond the glumes. Fortunately I pulled enough of one of the plants to show a bit of stolon. This charac-

teristic, along with the short awns and lobulate, rather than nearly continuous panicle, Professor M. L. Fernald states, marks at once the European *Alopecurus ventricosus* Pers. The European floras give these points as the quickest key characters for this species. The culms of *A. ventricosus* rise mostly solitary from the tips of stolons, whereas *A. pratensis* has a denser habit with the culms arising from among tussocks of foliage. Again, the glumes of *A. ventricosus* are prolonged and somewhat divergent, much exceeding the lemmas.

Professor Fernald states that so far as he knows this is the first evidence of *A. ventricosus* in North America and doubtless botanists will be interested in observing closely for further occurrences of this species on the continent. I have recently found it in abundance at Mt. Pearl, near St. John's.

Specimens from Upper Ferry and from Mt. Pearl have been deposited in the Gray Herbarium, Harvard University.—Ivan J. Green, Agricultural Division, Department of Natural Resources, St. John's, Newfoundland.

White-flowered Form of Asclepias syriaca.—The usual flower-color in the common milkweed (*Asclepias syriaca* L.) ranges from dull purple to deep pink, the corona-segments generally being a brighter and lighter shade than the petals proper. The particular flower-color, however, is constant for a clone, all the stems arising from the same creeping root, which may extend over a considerable area, bearing flowers of the same shade of color. On some occasions plants with pure white flowers are encountered. These lack all trace of pink or purple in the corolla and adjacent parts. Even on the pedicels, leaf-veins and stem, especially at the base of hairs and around the site of wounds, where the anthocyanin pigments show up if they are produced at all, the purple color is entirely lacking. As a consequence, such plants have a bright green appearance and stand out conspicuously when growing among the typical plants of dull green foliage. For them, the following designation is offered:

Asclepias syriaca L., forma **leucantha,** f. nova. Corona alba; petala alba vel virescentia. Planta tota sine pigmentis

rubris vel purpureis. Corona pure white: petals white or greenish. Whole plant lacking red or purple pigments. TYPE SPECIMEN: old pasture field, 4 miles west of Renfrew, Renfrew County, ONTARIO, July 8, 1943, *Dore*, in herbarium, Division of Botany, Science Service, Department of Agriculture, Ottawa. Additional specimens: roadside, near Pakenham, Concession II, Lot 8 of Fitzroy Tp., Carleton Co., Ontario, July 8, 1943, *Dore;* railroad embankment, east of Thurso, Papineau Co., Quebec, July 16, 1943, *Groh* and *Dore;* roadside, near Whitby, Ontario Co., Ontario, July 15, 1944, *Dore.*—W. G. DORE, Dalhousie University, Halifax, N. S.

SATUREJA VULGARIS (L.) Fritsch, var. **neogaea,** var. nov., a var. typica Europaea differt foliis supra glabris vel sparse strigoso-villosis subtus ad nervos strigoso-villosis vel -hispidis; corollis pallide lilacinis, tubo tenui.—The wide-ranging North American native. TYPE: cold walls of Percé Mt., Percé, Gaspé Co., Quebec, July 25, 1905, *Williams, Collins & Fernald* in Herb. Gray.

Typical Eurasian *Satureja vulgaris* has the leaves densely pubescent on both surfaces, above strigose-villous, beneath densely villous-sublanate, and the usually larger and thicker-tubed corolla is red-purple. The wide-ranging North American plant has the leaves often quite glabrous except for strigae along the nerves beneath, or the strigae may be more numerous and elongate but never with the sublanate appearance on the lower surfaces, as in the European plant, and, exceptionally, there are scattered strigae on the upper surfaces. The corolla in the American series is usually smaller than in the European, its tube more slender and its limb pale-lilac (rarely to whitish). As Mr. Long and I saw the European plant growing in 1930 it was impressively unlike the North American. Dissections of both series, however, show what at first appeared like morphological differences in the flowers to break down. I am, therefore, treating the American native as a variety, rather than as a distinct species.—M. L. FERNALD.

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LEGITIMACY OF NAMES IN BARTRAM'S "TRAVELS"

H. W. Rickett

Most botanists will share Fernald's sorrow at feeling obliged to change such a familiar name as *Heracleum lanatum* Michx. (Rhodora **46:** 50. 1944). It is a pleasant duty, therefore, to point out that Bartram's *Travels*[1] does not meet current requirements for the publication of specific epithets. Art. 68 of the *International Rules* says that "specific epithets are illegitimate . . . and must be rejected . . . when they were published in works in which the Linnean system of binary nomenclature for species was not consistently employed."

Bartram used binomials—*nomina trivialia*—pretty consistently in listing species which he had seen; occasionally, however, lapsing into polynomials, as on p. *378*, where we find *Pinus taeda, foliis geminatis et trinis, strobilo ovato* . . . and *Pinus palustris, foliis trinis longissimis, strobilo elongato*. . . . Occasionally he follows a binomial with a polynomial quoted from an older author, e. g., *Smilax pseudo-China; Smilax aspera, fructu nigro, radice nodosa* . . . ; Sloan, tom. l. p. 31 (p. *241*). There is nothing objectionable in these descriptive phrases appended to well known names. Several of his new species also he named with binomials, with or without an attached polynomial; e. g., *Hedera carnosa* (*fol. quinatis inciso-serratis, perennentibus*) (p. *243*), *Hydrangea quercifolia* (p. *382*), *Hypericum aureum* (p. *383*), *Myrica inodora* (p. *405*), *Bignonia bracteata*

[1] The citations are from the original (Philadelphia) edition of 1791. In the London reprint of 1794 the items cited occur on two pages short of those in the original—376 instead of 378, etc.

(p. *468*), and *Heracleum maximum* (p. *344*). For others, however, he used polynomials with no indication of a "trivial name." It is true that *Stewartia montana, fol. ovatis acuminatis serratis, flor. niveo, staminum corona fulgida, pericarp. pomum exsuccum, apice acuminato dehiscens* (p. *334*) might be taken as publication of the binomial *Stewartia montana*, being much in the manner of the 8th edition of Miller's *Gardeners Dictionary;* and, in fact, it was so interpreted by the compilers of the *Index Kewensis.* Similarly *Magnolia pyramidata, foliis ovatis, oblongis, acuminatis, basi auriculatis, strobilo oblongo ovato* (p. *408*) was taken up by Pursh and has been generally and rather inconsistently attributed to him. Similar action might be taken for the "new species of the Oenothera (Oenothera grandiflora, caule erecto, ramoso . . .), perhaps the most pompous and brilliant herbaceous plant yet known to exist" (p. *406*), of *Aesculus sylvatica, floribus ex albo et carneo* . . . (p. *476*), *Corypha repens, frondibus expansis, flabelliformibus* . . . (p. *61*), and several others; though these are missing from the *Index Kewensis* and seem to have been generally ignored. Such names, however, are typical pre-Linnean polynomials; if a trivial name had been intended, it would probably have been designated by italic or in some other way. And when we find *Ipomoea, caule erecto, ramoso, tripedali* . . . proposed on p. *376* for a new species of *Ipomoea*, we can admit no further doubt; and again "the fantastic Clitoria . . . (Clit. caule volubili fol. ternatis pennatisque . . .)" (p. *243*). One must bear in mind that in Bartram's day there was no such sharp distinction as now exists between "name" and "description." To name a plant adequately was also to describe its essential features. It is obvious that Bartram did not consistently employ the binary system. The same conclusion results from looking through the lists of birds on pp. *287–296*.

There is, I suppose, no gain without some loss. Three of Bartram's binomials were taken up by Small in his *Flora of the Southeastern United States* and are doubtless in common use: *Hydrangea quercifolia*, *Hypericum aureum*, and *Magnolia pyramidata.* A fourth, *Myrica inodora*, was the basis of *Morella inodora* and later of *Cerothamnus inodorus.* (Small doubtless got these from the *Index Kewensis; Heracleum maximum* escaped.)

Hydrangea quercifolia may be attributed to Nuttall (Gen. **1:** 284. 1818), who did not mention Bartram. *Hypericum aureum* may be cited ex Torr. & Gray, Fl. N. Am. **1:** 161 (1838). *Magnolia pyramidata* is correctly cited ex Pursh, Fl. Am. Sept. 382 (1814). *Myrica inodora* seems to have been first legitimately published by Chapman (Fl. S. U. S. 427. 1860).

The New York Botanical Garden.

[It is a real satisfaction to have Dr. Rickett's demonstration that, when not validated by later authors, the names in Bartram's *Travels* are invalid. Those wrongly accepted by me in Rhodora, xlvi. 44–50 should not be taken up.—M. L. F.]

AMERICAN THALICTRA AND THEIR OLD WORLD ALLIES

Bernard Boivin

(*Continued from page 377*)

Subgenus **Lecoyerium,** subg. nov. *Inflorescentia* paniculata, rarissime subcorymbosa. *Flores* dioici vel polygami vel monoici vel in paucis perfecti. *Sepala* 4–(6), superantur *stigmatibus* tempore anthesis. Species typica *Thalictrum dioicum* L. sit.

Sectio **Cincinneria** sect. nov. Sect. *Camptogastrum,* b. *Macrocarpa* Prantl, Nat. Pfl. **3,** 2: 66, 1888.—*Plantae* elatae; in speciebus nonnullis nitentes in proximis, glabrae vel puberulentes circa *nodos* aetate florendi. *Folia* percomposita, inflorescentiae numerosa, *foliolis* subrotundis, apice plus minusve trilobatis vel grosse dentatis. *Pedunculi* longissimi et pendentes aetate fructuum maturandorum, brevissimi tamen aetate florendi. *Flores* perfecti, *carpellis* 1–4, *staminibus* purpureis antheris mucronatis. *Sepala* viridia (an semper?). *Stigmata* saepius truncata aetate fructuum maturandorum. *Fructus* plus minusve recurvatus vel fere rectus, plus minusve compressus vel, si sectus, rotundus, *nervis* rugosis, *T. impexo* nostro excepto, stipitatus, nec costatus. Species typica *Thalictrum cincinnatum* nostrum sit.

Height attributed herewith to the different species is based mainly on measurements of a few nearly complete individuals which have been folded until they fitted the Procrustean bed of an herbarium sheet. Collector's observations were available only in the case of *T. Mannii* Hutchinson and on two herbarium sheets, one of *T. innitens* nostrum and one of *T. Steinbachii* nostrum.

The underground system of all the species of this section is unknown. There seems to be no fixed flowering season for the African species, at least those from central Africa.

Clavis ad Florentia

a. Antherae 0.8–0.9 mm., sepala 1.3–2.0 mm. longa, filamenta 1.5–3.0 mm. longa....*b.*
  b. Stigma 1.5–3.0 mm.....*c.*
    c. Filamenta ca. 1.5 mm., sepala 1.3–1.5 mm. longa....30. *T. aduncum.*
    c. Filamenta ca. 2.5 mm., sepala 1.5–2.0 mm. longa....32. *T. innitens.*
  b. Stigma 4.0–5.0 mm..........................31. *T. rhynchocarpum.*
a. Antherae 1.2–3.0 mm., sepala 1.2–6.0 mm. longa....*d.*
  d. Carpella singula raro gemina in floribus singulis....*e.*
    e. Sepala 2.0–3.0 mm. longa....*f.*
      f. Filamenta ca. 8.0 mm.....................37. *T. Steyermarkii.*
      f. Filamenta 3.0–4.5 mm.....*g.*
        g. Stylus una stigmate ca. 4.5 mm., stamina 13–19 in floribus singulis..........................33. *T. Chapinii*
        g. Stylus una stigmate 2.0–4.0 mm., stamina 5–8 in floribus singulis..........................34. *T. impexum*
    e. Sepala ca. 5.0 mm. longa..........................35. *T. Stolzii.*
  d. Carpella 2–4 in floribus singulis....*h.*
    h. Sepala 1.8–3.5 mm. longa....*i.*
      i. Stylus una stigmate 4–7 mm.....*j.*
        j. Sepala 2.0–3.5 mm. longa.....................33. *T. Chapinii.*
        j. Sepala ca. 1.8 mm. longa...................36. *T. Steinbachii.*
      i. Stylus una stigmate 8–13 mm.....*k.*
        k. Stylus una cum stigmate ca. 13 mm.......37. *T. Steyermarkii.*
        k. Stylus una stigmate 8–10 mm..............38. *T. cincinnatum.*
    h. Sepala ca. 6 mm. longa......................39. *T. macrocarpum.*

Clavis ad Fructus ferentia

a. Carpella sessilia....................................34. *T. impexum.*
a. Carpella stipitata....*b.*
  b. Carpella solitaria, rarissime gemina....*c.*
    c. Carpella compressa, ad tergi medias valde recurvata..30. *T. aduncum.*
    c. Venter carpelli parum si vero recurvatum....*d.*
      d. Carpella 3–4 mm. lata....................37. *T. Steyermarkii.*
      d. Carpella 1.5–2.4 mm. lata....*e.*
        e. Venter carpelli oblanceolatum, ad extremas parum recurvatum..........................31. *T. rhynchocarpum.*
        e. Ventrum carpelli lanceolatum vel ovato-lanceolatum....*f.*
          f. Stylus una stigmate 3.5–4.5 mm..............32. *T. innitens.*
          f. Stylus una stigmate 5.0–6.0 mm............33. *T. Chapinii.*
  b. Carpella nunc solitaria, nunc gemina, nunc ternata, in eadem planta....*g.*
    g. Africanum, carpellis lanceolatis..................33. *T. Chapinii.*
    g. Americana vel pyrenaicum, carpellis semiovatis vel ovatis....*h.*
      h. Venter carpelli parum recurvatum 3–5 mm. longum. 36. *T. Steinbachii.*
      h. Venter carpelli 5.0–7.5 mm. longum, nervo dorsali convexo vel recto, tamen ad medias parum concavo....*i.*
        i. Pedunculi debiles recurvati, pendentes, nisi steriles. Plantae elatae. Inflorescentia copiose ramosa....*j.*
          j. Stipes ca. 1 mm.......................37. *T. Steyermarkii.*
          j. Stipes 2.0–3.5 mm......................38. *T. cincinnatum.*
        i. Pedunculi rigidi ascendentes. Plantae semimetrales. Inflorescentia simplex vel fere simplex....39. *T. macrocarpum.*

T. Stolzii Ulbrich being known only from flowering material has been, consequently, omitted from the second key.

As the fruit reaches maturity, the stigma is likely to break off somewhere along its length. The accompanying illustrations all represent such shortened stigmas, but unbroken ones are usually to be found on each herbarium sheet. Vegetative characters vary but little through the section, exception being made of *T. macrocarpum* Gren.

30. T. **aduncum,** sp. nov. *Planta* metralis vel paululum altior. *Folia* 5–6-ternata, *foliolis* parvis. *Pedunculi* ca. 10 cm., fructubus maturis. *Sepala* 1.3–1.5 mm. longa. *Stamina* 5–6. *Filamenta* ca. 1.5 mm. *Antherae* oblongae, 0.8–0.9 mm. longae, apice obtusae, breviter acuminatae. *Ovaria* solitaria. *Stylus* una stigmate 1.5–2.0 mm., aetate maturandi 4.5–6.0 mm. *Fructus* 13.5–15.5 mm. longus, compressus, ad medias valde recurvatus, *stipite* 2.5–3.0 mm., ventre ca. 7.0 mm. longo, ca. 2.5 mm. lato, *nervis* simplicibus.—CONGO: *Humbert 7448*, montagnes à l'ouest du lac Kivu, forêt à l'W de Tshibinda, alt. 2000–2400 m., février-mars 1929 (G, TYPE). FIG. 30, a–d.

31. T. RHYNCHOCARPUM Dill. & Rich., Ann. Sci. Nat. ser. 2, **14:** 262, 1841. *T. longepedunculatum* Hochst. & Steud. ex Steud. Nom. Bot. **2:** 676, 1841 ut synonymon, nec *Thalictrum longepedunculatum* Sennen, Bull. Soc. Bot. Fr. **73:** 642, 1926. *T. chymocarpum* Dill. ex Walp. Ann. Bot. Syst. **2:** 5, 1851. *T. Mannii* Hutchinson ex Hutchinson & Dalziel, Fl. W. Trop. Afr. **1:** 66, 1927.—*Planta* sesquimetralis usque bimetralis (an metralis usque ad quadrimetralis?). *Folia* ca. 5-ternata, *foliolis* 0.3–2.0 cm. diametro. *Sepala* 1.4–1.8 mm. longa. *Stamina* 5–10. *Antherae* ellipsoideae ca. 0.9 mm. *Filamenta* ca. 3.0 mm. *Stylus* una stigmate 4.0–5.0 mm., aetate maturandi 4.5–5.5 mm. *Carpella* matura 15.5–18.0 mm. longa, parum recurvata in apice *stipitis* 2.5–5.0 mm. et ad apicem ventris oblanceolati nec compressi 8–10 mm. longi et 1.5–1.8 mm. lati, *nervis* simplicibus.—NIGERIA: according to Hutchinson, in the Cameroon Mts. and at Buea and Fernando Po (type locality of *T. Mannii*). ABYSSINIA: *Schimper 472*, Berg Semajata, 7300 f., July 14, 1862 (G); *Schimper 1137*, inter Endchedcap et Schoata, 1838–1842 (G); *Schimper 1183*, Gerra, 7800 ft. (F). BELGIAN CONGO: *Linder 2116*, Mt. Ninagongo, 8000–9000 ft., Feb. 16, 1927 (G). FIG. 31, a–d.

The type of this species from Abyssinia, is presumably preserved at Paris and has not been seen, but the description is clear enough and, the species being the only one found in the mountains of Abyssinia, there is no doubt about its interpretation. The illustration in A. Richard Tent. Fl. Abyss., tabula 2, confirms this interpretation. On the herbarium sheet of *Schim-*

per 1137, there is the following manuscript note: "*Thalictrum rhynchocarpum. Ach. Rich. in Ann. sc. nat., Bot., XIV (1840) p. 262 (publ. le 24 Mars 1841)*".

Thalictrum longepedunculatum Hochst & Steud. was not given a new description when published, it was simply a new name for *T. rhynchocarpum* Dill. & Rich.

T. chymocarpum Dill. is probably an error of spelling or printing.

T. Mannii Hutchinson. Described from flowering specimens from Nigeria, a region from which I have not seen any *Thalictrum.* The characters stressed by the describer seem to fall within the range of variation of *T. rhynchocarpum* Dill. & Rich. The stamens and the fruit, however, are too briefly described to enable one to form a definite opinion about the status of this species. As described by Hutchinson, it is a plant 1 to 4 meters high. As far as records go, this is the tallest plant in the whole genus.

32. T. **innitens,** sp. nov. *Planta* ca. 1.5 metrorum. *Folia* usque ad septies ternata. *Pedicelli* ca. 10 cm. aetate fructuum maturandorum. *Sepala* 1.5–2.0 mm. longa. *Stamina* 5–6. *Antherae* ovoideae breviter mucronatae, ca. 0.8 mm. *Filamenta* ca. 2.5 mm. *Ovaria* solitaria, *stigmate* 2.0–3.0 mm. usque ad 4.5 mm. accedente cum carpella maturant. *Fructus* compressus rectus vel parum recurvatus 10–14 mm. longus, *stipite* 1.5–2.0 mm., *ventre* ovoideo-lanceolato 6.5–7.5 mm. longo, 2.0–2.4 mm. lato, *nervis* arcuantibus simplicibus.—Nyassa: *Buchanan 64*, 1891 (US); *Stolz 148*, Station Kyimbila, Bundali Gebirge, 1300–1500 Meter Seehöhe, Nov. 25, 1907 (G, US). Rhodesia: *Swynnerton 352*, Chipete forest-patch, a climber common on forest outskirts, alt. 3800 ft., 1906 (US). Transvaal: *Drakensberg*, Pilgrim's Rest (F 69,381). Orange: *Cooper 1038*, in woods, 1862 (NY). Natal: *Wylie* (*J. M. Wood's* no. 8128), Wahawag Mtn., alt. 6–7000 ped., March 22, 1901 (US). Cape: *Murray 598*, in densis sylvis "Kabousie", alt. 3500 ft., flor. dec. (G, type; F, isotype). Fig. 32, a–d.

It is doubtful whether this plant really is a climber. The herbarium specimens show no evidence to that effect. The stem is hollow, thin and rather easily crushed and seems an inappropriate support for a plant of this size. The large and abundantly branched inflorescence with its pendulous fruits is likely to become more or less entangled in the branches of adjoining shrubs, thus giving the plant the additional support needed.

This undoubtedly holds true for most of the species of the § Cincinneria, especially the tallest ones.

33. T. **Chapinii,** sp. nov. *Planta* circa sesquimetralis. *Folia* usque ad quinquies ternata. *Pedicelli* 5–10 mm. *Sepala* 2.0–3.5 mm. longa. *Stamina* 13–19. *Antherae* oblongo-lanceolatae 1.4–2.1 mm., *mucrone* 0.2–0.7 mm. *Filamenta* 3.2–4.5 mm. *Ovaria* nunc singula nunc gemina, nunc ternata. *Stigma,* aetate fructus maturandi, 5.0–6.0 mm. *Carpella* matura parum recurvata compressaque, 13.0–14.5 mm. longa, *stipite* 1.5 mm., ventre ca. 6.5 mm. longo, ca. 2.0 mm. lato, *nervis* arcuantibus simplicibusque.—Congo: *Chapin 386,* slope of Mt. Karisimbi, Kivu district, alt. 11,000 ft., rather common about Kabara, about same level, June 19, 1927 (NY, type); *J. P. Chapin 518,* Kivu district, mts. s. w. of Lemera, lower Ruzizi Valley, alt. 9600 ft., July 17, 1927 (NY). Kenya: *Mearns 1350 & 1414,* western slopes of Mount Kenia, along the trail from West Kenia Forest Station to summit, in the "giant heath" zone, at about 3630 meters, Sept. 21–27, 1909 (1350:US; 1414:NY, US); *Mearns 1670 & 2320,* western slopes of Mount Kenia, along the trail from West Kenia Forest Station to summit, bamboo zone, at about 3000 meters, Sept. 28–Oct. 7, 1909 (1670: F, US; 2320: US). Fig. 33, a–d.

Although flowering material of *T. Chapinii* and *T. innitens* is distinguished easily indeed, these species become more or less confluent as they mature their fruits.

34. T. **impexum,** sp. nov. *Planta* verosimiliter circa bimetralis. *Folia* ternata usque ad sexies. *Pedunculi* 5–9 cm. *Sepala* 2.0–2.4 mm. longa. *Stamina* 5–8 in floribus singulis. *Antherae* oblongo-lanceolatae. *Ovaria* singula rarius gemina, *stigmate* 2.0–4.0 mm., aetate maturandi, 4.0–5.0 mm. longo, 1.1–1.3 mm. lato, *pariete* membranaceo, *nervis* simplicibus parumque arcuantibus.—Congo: *Chapin 143,* Kalongi, Batahu Valley, West Ruwenzori, alt. 6900 ft., Dec. 29, 1926 (NY); *Chapin 188,* Kalongi, West Ruwenzori, common hereabout, fl. dull dark purplish tinged with green, alt. 6950 ft., Jan. 8, 1927 (NY). Kenya: *A. G. Curtis 817,* Mau range, a forest valley, leaves apple-green, alt. 5000 to 7000 ft., July 26, 1923 (G); idem *839,* flower brownish, leaf dark cress-green, July 27 (G); idem *850,* leaves parrot-green, July 27 (G); *Mearns 595 & 630,* between the Naiok River and Lake Naivasha, alt. 1800–2100 m., July 9–12, 1909 (595: US; 630: US, 630, 652, type: US 630, 653 isotype). Fig. 34, a–d.

This species is peculiar for this section because of its nearly sessile fruit. When in flower it closely recsembles *T. Chapinii* which occupies about the same range at higher altitudes.

35. T. Stolzii Ulbrich, Notizbl. Berl. Gart. **10:** 916, 1930. Herba perennis erecta ad 1.25–1.50 m. alta parce ramosa *caule* basi 7–8 mm. crasso, omnino glaberrimo fusco-violaceo. *Folia* caulina in vaginam fere 35 mm. longam 15–20 mm. latam dilatato, usque ad laminae ramificationem ± 12 cm. longo glaberrimo; lamina 3–4-pinnata *foliolis* ± 3 mm. petiolulatis circuitu orbicularibus vel reniformibus margine grosse crenatis crenis subapiculatis, 10–12 mm. longis, 10–15 mm. latis, glaberrimis, supra atroviridibus, subtus glaucescentibus, nervis reticulatis supra inconspicuis, subtus prominentibus. *Inflorescentia* satis parva decomposita contracta paniculata. *Flores* satis magni lilacei *pedicello* brevissimo, 2–4 mm. longo, glaberrimo instructi patentes, basi *bractea* lineari-lanceolata ± 4 mm. longa membranacea, 0.5–1 mm. lata glaberrima lilacea munita; *sepala* ovalia vel late-ovalia ± 5 mm. longa, ± 3 mm. lata, obtusa, glaberrima ± quinquenervia. *Stamina* ± 8 mm. longa *filamentis* filiformibus tenerrimis glaberrimis superne vix dilatatis sparsis (5–10), *anthera* lineari-oblonga 1–1.5 mm. longa. *Ovaria* (plerumque in flore unicum, rarius 2) brevissime stipitata vel subsessilia glaberrima anguste lineari-lanceolata cum stylo ± 5 mm. longa in stylum fere 3 mm. longum rectum sensim attenuata; *stigma* apice lateraliter decurrens fere 1 mm. longum. Fructus ignotus.—"*Ostafrika*: Nyassa-Hochland Kyimbila im Bambuswalde bei Bulongwa, ca. 2100 m ü. d. M. (blühend 17. September 1913—Ad. Stolz n. 2175!)."

"Die Art steht in der Fruchtbildung augenscheinlich *Th. rhynchocarpum* Dill. und Rich. nahe, das gleichfalls nur wenige bis 1 Fruchtblatt . . . hat aber einen sehr lockeren, sparrig verzweigten Blütenstand und sehr kleine grüne Blüten. *Th. Stolzii* ist leicht kenntlich an den grossen rötlichen oder lila Blüten in einem (im vorliegenden Material) dicht zusammengezogenen Blütenstande. Leider liegen keine bis zur Fruchtreife entwickelten Pflanzen vor; es ist jedoch anzunehmen, dass sich der Blütenstand später in vielleicht ähnlicher Weise wie bei *Th. rhynchocarpum* streckt.

"Es ist auffällig, dass unter dem sehr reichhaltigen Material, welches das Botanische Museum in Berlin-Dahlem aus dem tropischen Afrika erhielt, diese Art bisher nicht vertreten war; sie scheint demnach selten und bisher übersehen zu sein.

"Anmerkung: Im gleichen Gebiete: Kyimbila, Mkinga, Mwakalila, Bergwiese in 2000 m ü. d. M. sammelte Ad. Stolz (8. Januar 1914 n. 2421!) eine Pflanze, die wohl gleichfalls hierher zu stellen ist. Diese ist nur etwa 40 cm hoch, unverzweigt mit

kleinen Blättern und meergrünen Blättchen mit meist dreilappiger Spreite. Die Blüten (es liegen nur Knospen vor) sind gleichfalls sehr gross und nach Angabe des Sammlers weiss, aussen rosa. Es handelt sich vermutlich nur um eine Lichtform von *Th. Stolzii*, doch ist das Material leider zu spärlich, um eine sichere Bestimmung zu ermöglichen."

The preceding text is a copy of the original description and comments.

No material has been seen which could be ascribed to this species; however the characters of the flowers contrast strongly with all other species of this section. Ulbrich's description of the inflorescence of *T. Stolzii* applies equally well to the flowering stage of any species of this group. Similarly his description of the inflorescence of *T. rhynchocarpum* Dill. & Rich. characterizes all fruiting material belonging to the § CINCINNERIA. The leaves are described as "*pinnata*," but this we much doubt. If true indeed, there should be no trouble at all to recognize the species at any stage of its life-cycle. The fruits are not described and it is difficult to guess what they look like. The only material at hand from Nyassa (*Stolz 148*, 25 Dez., 1907), bears immature fruits strongly suggesting those of *T. innitens* but they are somewhat narrower. This latter specimen is cited under *T. innitens*.

36. T. **Steinbachii,** sp. nov. *Planta* ca. 3 m. alta. *Pedicelli* 5–10 cm. *Sepala* ca. 1.8 mm. longa, *Ovaria* nervosa pauca, 2–4 in flore. *Stylus* una stigmate 4–7 mm. *Carpella* matura recurvata semi-ovata, 6.0–8.5 mm. longa, *stipite* 1.5–2.0 mm., ventre 3.0–5.0 mm. longo, 1.5–2.0 mm. lato, *nervo* dorsali concavo. Floret verosimiliter Decembri.—BOLIVIA: *Steinbach 8869*, Incachaca, Prov. Chapare, Depart. Cochabamba, Feuchte Böschung, Meereshöhe 2200 m., Jan. 21, 1929 (G, TYPE and ISOTYPE; F, NY, ANS, ISOTYPES). FIG. 36, a–c.

One specimen bears the following note: *ca 3 M. Ranksustande.* This plant is probably no more of a climber than *T. innitens* but, just as does the latter, probably gains additional support when its inflorescence gets entangled in the surrounding vegetation.

37. T. STEYERMARKII Standley, Field Mus. Nat. Hist. Bot. **22:** 230, 1940. *Planta* 1.0–2.5 metrorum, glabra nisi in carpellis. *Folia* nonnunquam metralia, ad septies ternata, saepius conspicue stipellulata. *Pedicelli* ca. 5 cm. *Sepala* elliptica purpurascentia ca. 3 mm. longa. *Filamenta* ca. 8 mm. *Antherae* oblongo-lanceolatae ca. 3 mm., acumine 0.2–0.6 mm. *Stylus*

una cum stigmate ca. 13 mm. *Carpella* matura firma 9–12 mm. longa, cinerea, pubescentia. *Pubescentia* pilorum translucidorum rectorum densorum arachnoideorum. Si pubescentia tactu deleta est, carpella purpurascentia revelantur. *Nervi* fructuum in costis sublati, plus minusve ramosi et anastomosi, minute ad summas sinuosi et nonnunquam gibbosi, nervus ventralis convexior et semper gibbosus, dorsalis rectus esset nisi ad medias parum concavitas. *Stipes* fructus ca. 1 mm., venter 5.5–6.5 mm. longus et 3.0–4.0 mm. latus, rostrum 2.5–4.0 mm. directum, paries 0.3–0.5 mm. crassitudinalis. Verosimiliter floret Novembri. GUATEMALA, SAN MARCOS: *Steyermark 36,575*, northwestern slopes of Volcán Tajumulco, barrancos south and west of town of Tajumulco, moist slopes around seepage at base of barranco, herbaceous, 8 ft. tall, leaves blue-green above, grass-green beneath, follicles glaucous-green, alt. 2300–2500 m., Feb. 25, 1940 (F, TYPE, mounted on two sheets); *Standley 68,465*, above San Rafael Pie de la Cuesta, Barranco Eminencia, wet meadow, common, alt. 2100–2400 m., March 14–15, 1939 (F, paratype); *Steyermark 36,483*, near southeast portion of Volcán Tacaná, between Canjula and La Unión Juárez, herb 5 ft. tall, leaves membranaceous, grass-green above, silvery-green beneath, Feb. 22, 1940 (F, paratypes); *Steyermark 36,989*, lower to middle slopes of Volcán Tajumulco, between Todos Santos and Finca El Provenir, slopes around quebrada, alt. 1300–3000 m., March 1, 1940 (F, paratype); *Steyermark 36,191*, between La Vega ridge along Rio Vega and northeast slopes of Volcán Tacaná, to 3 miles from Guatemala-Mexico boundary, in vicinity of San Rafael, shaded banks of slopes bordering escarpment of stream, herb 5 ft. tall, alt. 2500–3000 m., Feb. 20, 1940 (F, paratype). QUEZALTENANGO: *Standley 83,523*, south of San Martín Chile Verde, region of Las Nubes, damp densely forested barranco, herb 2 m. tall, alt. about 2250 m., Jan. 16, 1941 (F); *Standley 85,131*, South of San Martín Chile Verde, region of Las Nubes, on white sand mountain side, damp thicket, herb 1.5 m. tall, alt. about 2250 m., Jan. 27, 1941 (F); *Standley 85,680*, between San Martín Chile Verde and Colombo, above Mujuliá, in damp dense mixed forest on white sand slopes, herb 1.5 m. tall, alt. about 1800 m., Feb. 1, 1941 (F); *Standley 83,652*, south of San Martín Chile Verde, region of Las Nubes, densely forested barranco, herb 1.5 m. tall, alt. about 2250 m., Jan. 16, 1941 (F); *Standley 85,140*, south of San Martín Chile Verde, region of Las Nubes, damp thicket, herb 1 m. tall, Jan. 27, 1941 (F). FIG. 37, a and b.

38. T. **cincinnatum,** sp. nov. *Planta* verosimiliter ca. 3 metrorum vel altior. *Pedicelli* 13–17 cm. *Antherae* oblongo-lanceolatae, ca. 2.5 mm. *Ovaria* 2–3 in flore. *Carpella* matura compressa, 9–13 mm. longa, stigmate 8–10 mm., *stipite* 2.0–3.5,

ventre 5.0–7.5 mm. longo, 2.5–3.0 mm. lato, *nervis* parum ramosis et parum anastomosis nervo dorsali fere recto nisi esset ad medias parum concavus. Tempus florendi ignotum verosimiliter vernale.—BOLIVIA: *Steinbach 9231*, Incachaca, Prov. Chapare, Dept. Cochabamba, Wald Meereshöhe 2300 m., Febr. 18, 1929 (G, TYPE; ANS, F, NY, ISOTYPES). FIG. 38, a and b.

Judging from the herbarium fragments, this species is probably as high if not higher than *T. Steinbachii* or even than *T. rhynchocarpum* Dill. & Rich. (*T. Mannii* Hutchinson).

39. T. MACROCARPUM Grenier, Séances Publ. Acad. Sci. Besançon 117. 1838. *T. majus* Gren. Act. Soc. Linn. Bordeaux, **8:** 2, 1836, nec *T. majus* Crantz, Stirp. Austr. **2:** 80, 1763, nec *T. majus* Jacq. Fl. Aust. **5:** t. 420, 1788, nec *T. majus* Tenore, Syll. Pl. Vasc. Fl. Neap. 265, 1831, nec *T. majus* Dunn, Ind. Sem. Hort. Panorm. 32, 1880.—*Planta* omnino glabra semimetralis. *Folia* inferiora 1–3 in planta, 4-ternata. *Folia* caulinaria desunt. *Folia* inflorescentiae inferioris 3-ternata *foliolis* 3–5-lobatis. *Folia* inflorescentiae superioris ovata integra. *Stipulae* et *stipellulae* desunt. *Inflorescentia* simplex vel, si ad basem ramosa, ramis bi-tri-floriferis foliumque solitarium ferentibus. *Pedunculi* 5–10 cm., aetate fructuum maturandorum. *Flores* lutei. *Sepala* elliptica 5–6 mm. longa. *Antherae* ca. 3 mm., *acumine* 1.0–1.5 mm. *Ovaria* 2–4 in flore. *Stigma* 8–9 mm., in primis rectum vel recurvatum, deinde incurvatum, alis ca. 0.5 mm. lat. *Carpella* matura valde compressa, *stipite* 0.5–2.0 mm., ventre 8.5–10.0 mm. longo et 3–4 mm. lato, *nervo* dorsali fere recto vel parum convexo, ventrali multo quam dorsali convexiore, nervis lateralibus conspicue ramosis et anastomosis. Floret Julio et Augusto.—FRANCE: *Cosson*, Basses Pyrénées, prope Eaux-Bonnes, in monte, montagne de Gourzi, 7 augusti, 1847 (G); *Forestier*, près les Eaux-Bonnes, pic d'Anis, 5 août, 1841 (G); *Philippe*, Basses Pyrénées, col de Tortes, août, 1847 (G). FIG. 39.

Sectio CAMPTOGASTRUM Prantl, Nat. Pfl. **3,** 2: 66, 1888. *Radix* fibrosa. *Folia* saepe stipellulata. *Foliolae* haud peltatae. *Pedicelli* sub fructum recurvatum. *Flores* polygamo-monoici, plurimi perfecti, pauci masculi, raro perfecti omnes. Masculi nonnulli ad anthesim veniunt cum carpella perfectorum maturant. *Antherae* oblongae lanceolatae vel lineares, plus minusve acuminatae. *Filamenta* purpurascentia nec clavata. *Ovaria* sessilia vel stipitata, saepius, si adsunt, 4–10 in floribus singulis. *Stigmata* filiformia, nec alata. *Carpella* matura plus minusve compressa, nonnunquam stipitata, *nervis* plus minusve ramosis, saepe et anastomosantibus et sinuosis et gibbosis. Species typica *Thalictrum gibbosum* Lec. sit.

Some of the species are described in the text as having all

flowers perfect, but this is a point still imperfectly known, for when the ovaries start enlarging the plant still goes on blooming but these later flowers are always staminate. This stage seems not to be represented for all species of this section. However, *T. Venturii* and *T. inuncans* are definitely known as always having perfect flowers.

The following key is based mainly on pubescence, notwithstanding the fact that the fruit has furnished the main characters on which to base each of the successive species. Only about one third of the herbarium specimens having mature fruits, and the flowers not being very much varied, it is not possible to build up a natural key which would be a satisfactory tool with which to identify herbarium material. Although this key is artificial it is still not possible to identify all flowering specimens, but it has been found that by comparing such flowering plants with only those species known to occur in the region of the plant to be named, it was usually possible to arrive at a satisfactory identification. This is why distribution-data have been given in the key.

a. Ovaria 18–36 in flore. In Argentina . . . . 71. *T. Venturii.*
a. Ovaria 0–10 in flore . . . . *b.*
  b. Pubescentia diversa, aliqui pilorum aciculariformes compressi triangulares et paullulum recurvati. Staminum filamenta 15–17 mm. In Bolivia . . . . 40. *T. inuncans.*
  b. Pili aciculariformes et recurvati desunt. Staminum filamenta breviora . . . . *c.*
    c. Planta nana 20–50 cm. alta, foliis imis plurimis, folium caulinarium vel solitarium vel deest, folia inflorescentiae vel 1–3, vel desunt. Foliolae parvae, 3–10 mm. longae. In Hidalgo . . . . 50. *T. pachuense.*
    c. Folia caulinaria plura . . . . *d.*
      d. Foliolae cordatae, dentatae, acuminatae. Pubescentia e pilis stellatis stipitatis. In Guatemala . . . . . . 51. *T. Standleyi.*
      d. Foliolae apice trilobatae vel grosse dentatae, nec acuminatae. Pubescentia vel e pilis simplicibus vel deest . . . . *e.*
        e. Foliolae inferne glabrae . . . . *f.*
          f. Stylus una cum stigmate 2–4 (–5) mm. . . . . *g.*
            g. Filamenta 3–5 mm. Carpella matura 2.7–3.5 mm. longa . . . . *h.*
              h. Filamenta 4–5 mm. Carpella matura ca. 3.5 mm. longa, nervis simplicibus nec ramosis. In Vera Cruz . . . . 41. *T. Galeottii.*
              h. Filamenta ca. 3 mm. Carpella matura 2.7–3.0 mm. longa, nervis ramosis et anastomosantibus, nervo ventrali gibboso. In Sonora 55. *T. parvifructum.*
            g. Filamenta 6–10 mm. Carpella matura 6–9 mm. longa . . . . *i.*

i. Antherae apice truncatae, vel acumine 0.1–0.2 mm. Carpella matura gibbosa. In Guatemala .... 52. *T. Johnstonii.*
i. Antherae acumine 0.5–1.0 mm. Carpella matura non gibbosa. In Peruvia, Bolivia, et Argentina .... 43. *T. decipiens.*
f. Stylus una stigmate (4–) 5–15 mm. . . . *j.*
j. Carpella matura nervo ventrali nullo modo gibboso . . . . *k.*
k. Nervis lateralibus parum ramosis, nec sinuosis, nec anastomosantibus . . . . *l.*
l. Stylus una stigmate 4–10 mm . . . . *m.*
m. Carpella matura 4.5–5.5 mm. longa. In Mexico et Costa Rica .... 42. *T. Hintonii.*
m. Carpella matura 6.5 mm. vel longiora . . . . *n.*
n. Carpella 2–3 mm. lata nervo dorsali convexo vel fere recto. Stigma 4–8 mm. Planta nonnunquam glauca. In Peruvia, Bolivia et Argentina. 43. *T. decipiens.*
n. Carpella 3.0–3.2 mm. lata, nervo dorsali basi concavo. Stigma 8–10 mm. longum. Planta nullo modo glauca. In Panama. .... 44. *T. viridulum.*
l. Stylus una stigmate 10–15 mm. In Peruvia .... 46. *T. Macbrideanum.*
k. Nervis lateralibus ramosis et anastomosantibus, saepe sinuosis . . . . *o.*
o. Stipes ovarii 0.5–1.5 mm. Carpella matura 9–10.5 mm. longa. In Venezuela, Colombia et Ecuador .... 70. *T. podocarpum.*
o. Stipes ovarii 0–0.5 mm. Carpella matura 4.5–8.0 mm. longa . . . . *p.*
p. Carpella matura 6.5–8.0 mm. longa. In Tamaulipas, Nuevo León et San Luis Potosí .... 47. *T. Deamii.*
p. Carpella matura 4.5–5.5 mm. longa . . . . *q.*
q. Folia caulinaria conspicue petiolata. Planta glauca. In Chihuahua, Durango, Nuevo León et San Luis Potosí .... 48. *T. grandifolium.*
q. Folia caulinaria sessilia in apice dilatationis petiolaris. Planta nullo modo glauca. In Guerrero .... 49. *T. Hernandezii.*
j. Carpella matura nervo ventrali gibboso, lateralibus saepius gibbosis. Gibbositas patet nonunquam in ovario, saepius tamen in carpellis immaturis . . . . *r.*
r. Carpella matura 2.7–3.0 mm. longa. Planta semimetralis vel minor. In Sonora 54. *T. parvifructum.*
r. Carpella matura 4.0–10.5 mm. longa . . . . *s.*
s. Carpella matura 4–8 mm. longa . . . . *t.*
t. Carpella matura 4–6.5 mm. longa . . . . *u.*
u. Petioluli divaricati vel refracti parum incurvati. Foliolae basi cordatae. Carpella matura 6.0–6.5 mm. longa, 3.0–3.2 mm. lata, stipite 0.5–1.0 mm. Stipes ovarii 0–0.5 mm. In Colombia .... 63. *T. refractum.*

u. Petioluli plus minusve ascendentes. Sepala 2–5 mm. longa. . . . *v*.

v. Carpella matura 4–6 mm. longa, 1.8–2.0 mm. lata, stipite 1–3 mm. Sepala 2.5–3.5 mm. longa. Stipes ovarii 0.5–1.0 mm. In Baja California. . . . . 64. *T. peninsulare.*

v. Carpella matura 4–8 mm. longa, 2–3 mm. lata, stipite 0.5–2 mm. Sepala 3–5 mm. longa. Stipes ovarii 0.2–0.5 mm. longus. In Vera Cruz, Hidalgo, Mexico, Puebla, Morelos et Oaxaca. . . . . 65. *T. gibbosum.*

t. Carpella matura 7–8 mm. longa. . . . *w*.

w. Carpella matura saepius apice acuta, 7–8 mm. longa, 2–3 mm. lata, stipite 0.5–2.0 mm. Sepala 3–5 mm. longa. Stipes ovarii 0.2–0.5 mm. longus. In Vera Cruz, Hidalgo, Mexico, Puebla, Morelos et Oaxaca. . . . 65. *T. gibbosum.*

w. Carpella matura saepius apice obtuso, 7–7.5 mm. longa, ca. 3.3 mm. lata, stipite 1.0–2.5 mm. Sepala 5–6.5 mm. Stipes ovarii 0.5–1.5 mm. In Ecuador. . . . . 66. *T. vesiculosum.*

s. Carpella matura 9.0–10.5 mm. longa. In Colombia, Venezuela et Ecuador. 69. *T. podocarpum.*

e. Foliolae inferne plus minusve pubescentes. . . . *x*.

x. Pubescentia caulinaria e pilis opacis undulatis, acuminatis 1–4 millimetralibus. Foliolae inferne sparse pubescentes. In Oaxaca et Puebla. . . . . 53. *T. lanatum.*

x. Pubescentia caulinaria e pilis millimetralibus vel brevioribus vel deest. . . . *y*.

y. Pubescentia foliorum paginae inferioris e pilis omnibus capitatis. . . . *z*.

z. Planta omnino pubescens carpellis maturis ca. 6.5 mm. longis, 2.0–2.2 mm. latis. In Panama. . . . . 45. *T. panamense.*

z. Foliolae superne glabrae. . . . *α*.

α. Pili caulinarii et rameales uniseriati et translucidi. Carpella matura ca. 3 mm. longa. In Durango. . . . . 54. *T. Pennellii.*

α. Pili omnes capitati et translucidi. Carpella matura 4.0–5.5 mm. longa. . . . β.

β. Sepala viridia ca. 3 mm. longa. Carpella matura ca. 5.5 mm. longa, ca. 3.8 mm. lata. In Coahuila. . . . . 57. *T. laeteviride.*

β. Sepala colorata 3.8–4.5 mm. longa. Carpella matura 4–5 mm. longa, 2.3–2.9 mm. lata. In Mexico. . 59. *T. subpubescens.*

y. Pubescentia e pilis vel uniseriatis translucidis, vel opacis crassiusculis coloratis vel aliis capitatis, aliis opacis crassiusculis coloratis. . . . γ.

γ. Pubescentia e pilis omnibus uniseriatis translucidis densisque. . . . *δ*.

δ. Carpella glabra. In Vera Cruz, Mexico, Distrito Federal et Oaxaca. . . . . 61. *T. Conzattii.*

δ. Carpella plus minusve pubescentia. . . . *ε*.

ε. Folia caulinaria conspicue petiolatá. Carpella matura 3.3–5.0 mm. longa. In Jalisco, Hidalgo et Michoacán. 60. *T. pubigerum.*

ε. Folia caulinaria sessilia vel fere sessilia in apice dilatationis petiolaris. Carpella matura 5–6 mm. longa. In Mexico, Michoacán et Puebla. 62. *T. sessilifolium.*

γ. Pubescentia e pilis omnibus crassiusculis opacis coloratis, vel aliis crassiusculis coloratis opacis obtusis interdum acuminatis....ζ.

ζ. Carpella matura 2.7–3.0 mm. longa. Stylus una stigmate 3–5 mm. Planta semimetralis vel brevior. In Sonora. 55. *T. parvifructum.*

ζ. Carpella matura 3.5–8.0 mm. longa....η.

η. Foliolae inferne densissime pubescentes....θ.

θ. Carpella matura 3.5–4.5 mm. longa. In San Luis Potosí, Zacatecas, Vera Cruz, Hidalgo, Mexico, Distrito Federal et Michoacán......56. *T. strigillosum.*

θ. Carpella matura 7–8 mm. longa. In Oaxaca......................69. *T. Nelsonii.*

η. Foliolae inferne sparse pubescentes....ι.

ι. Stigma 8–10 mm. In Peruvia..66. *T. longistylum.*

ι. Stigma brevius....κ.

κ. Carpella matura 5–6.5 mm. longa. In Peruvia....λ.

λ. Carpella matura stipite 0.5–1.0 mm..................58. *T. lasiostylum.*

λ. Carpella matura stipite ca. 2 mm 67. *T. rutidocarpum.*

κ. Carpella matura 7–8 mm. longa. In Oaxaca.................69. *T. Nelsonii.*

This section is restricted to the mountains of Mexico, Central America and South America. In general, the species are based on the different types of fruits, for the flowers offer but few specific characteristics. However, two species, *T. gibbosum* Lec. and *T. decipiens* nostrum, show a high degree of variation in their fruits and they are pretty hard to characterize. A key to the flowering specimens would leave about 8 or 10 species, all glabrous, which could not be otherwise separated were it not for the fact that their ranges do not overlap in general. The interpretation of the different names already published is based on types or isotypes or syntypes or photographs of types or fragments of types. Only in two cases, *T. Hernandezii* Tausch and *T. lasiostylum* Presl, was it necessary to form an opinion on the original description only. Lecoyer did not have the opportunity of studying the types of those two species and considered them as synonyms.

Subsectio Simplicia, subsect. nov. *Plantae* glabrae, *Thalictro inuncante* nostro excepto. *Ovaria* 10 vel pauciora in flore. *Carpella* matura compressa *nervis* simplicibus vel parum ramosis anastomosantibus et reticulatis, nec gibbosis, raro sinuosis.

40. T. **inuncans,** sp. nov. *Planta* verosimiliter 1.5–2.0 m. alta. *Pubescentia* caulis ramorum petiolorum petiolulorumque densa e pilis aliis capitatis translucidis, aliis crassiusculis triangularibus compressis recurvatisque. *Foliolae* superne glabrae, inferne puberulentes pilis capitatis translucidis vestitae. *Flores* perfecti (!) glabri. *Sepala* ovata ca. 5 mm. longa. *Antherae* nonnunquam falcatae ca. 4 mm., vel apice truncatae, vel obtusae cum acumine 0.1–0.2 mm. *Filamenta* 15–17 mm., conspicue purpurascentia. *Stylus* una cum stigmate 6–11 mm. *Stigma* paullo et regulariter a basi incrassatum. *Fructus* mihi ignotus. Floret Decembri.—Bolivia, tarija: *Fiebrig 2440*, Tecumilla bei Tarija, alt. 2000 m., Dez. 20, 1903 (G, type and isotype: US, isotype). Fig. 40, a–c.

Although known only from one collection and at flowering time, this species should be easily recognized by its dense covering of very small recurved prickles, the only such case known to me in this genus. The filaments of the stamens are also longer than in any other species of *Thalictrum*. This species shows some relationship with *T. Venturii*, but its position is dubious. Both of these species have perfact flowers, obtuse or truncate anthers and somewhat clavate stigmas.

41. T. Galeottii Lecoyer, Bull. Soc. Bot. Belg. **24:** 121, 1885. *Planta* omnino glabra altitudinis ignotae, verosimiliter metralis vel brevior. *Flores* forsan omnes perfecti. *Sepala* 3.5–4 mm. longa. *Antherae* 1.2–2.0 mm., oblongo-lanceolatae, in apice truncatae, vel acumine 0.1 mm. *Filamenta* 4–5 mm. *Stylus* una cum stigmate 3–4 mm. *Carpella* matura subsessilia vel sessilia, ca. 3.5 mm. longa, ca. 1.5 mm. lata, *nervis* lateralibus parum ramosis nec undulatis nec gibbosis, nervo dorsali fere recto, ventrali convexo. Tempus florendi ignotum.—Mexico, vera cruz: *Galeotti 4541*, pic d'Orizaba, fl. blanches, alt. 10,000 p., juin–oct., 1842 (syntype at the Conservatoire Botanique de Genève; F, photograph of this syntype; G, syntype). Fig. 41, a–c.

Naturally, I have not seen the syntype in Switzerland, but I cannot find anything which matches either the photograph or the syntype at hand. The other syntype is no. 4570 from Xalapa by the same collector. Judging from Lecoyer's drawing, which naturally was made from one of those syntypes, and the photo-

graph at hand, the fruit resembles pretty much that of what we are calling *T. Hernandezii* Tausch, but it is much smaller. The anthers and stigmas also rank amongst the smallest in that section of the genus.

42. T. **Hintonii,** sp. nov. *Planta* omnino glabra 40–120 cm., *radicibus* fibrosis. *Stipulae* parum dilatatae. *Foliolae* fere orbiculares, basi cordatae, apice trilobatae, lobis rotundis mucronulatis, nonnunquam figura *Hepaticae americanae,* variabiles tamen. *Inflorescentia* 1–3 dm. longa, plus minusve secunda, *pedunculis* vel rectis vel parum recurvatis. *Flores* non satis notae, *sepalis* tamen ca. 4.5 mm. longis, *antheris* ca. 5 mm., *acuminibus* ca. 1.0 mm. *Carpella* matura fere orbicularia vel semi-ovata, 4.5–5.5 mm. longa, *stipite* 0.1 mm., ventre ca. 4 mm. longo 2.0–3.2 mm. lato, *nervis* parum ramosis nec gibbosis, nervo dorsali recto vel vario modo convexo, ventrali convexiore quam dorsali. Floret tempore mihi ignoto.—MEXICO, MEXICO: *Hinton 6743,* Temascaltepec district, Acatitlán, in the water, Oct. 12, 1934 (US, TYPE; F, G, M, NY, ISOTYPES). GUATEMALA, QUEZALTENANGO: *Standley 67,837,* southwest of San Martín, Chile Verde, Cumbre de Tuilacán, sandy Alnus forest, alt. about 2400 m., March 8, 1939 (F). COSTA RICA: *Standley 35,247,* near the Finca del Volcán de Turrialba, southern slope of Volcán de Turrialba, wet thicket, herb 3–4 ft., alt. about 2000 to 2400 m., Feb. 22, 1924 (US). FIG. 42.

Dedicated to the late G. B. HINTON whose abundant and well prepared Mexican specimens form a large proportion of and are among the best of the material at hand.

43. T. **decipiens,** sp. nov. *Planta* omnino glabra, 4–15 dm., plus minusve glauca, *radice* forsan tuberosa et solitaria. *Inflorescentia* saepius foliosissima. *Pedunculi* sub fructum recurvati. *Sepala* 3–7 mm. longa, elliptica vel orbicularia. *Filamenta* 6–10 mm. *Antherae* 2.5–5.0 mm., *acumine* 0.5–1.0 mm. *Stylus* una cum stigmate 4–8 mm. *Carpella* matura obovata vel semiobovata, 6–9 mm. longa, *stipite* 0.5–1.5, ventre 3.5–6.5 mm. longo, 2–3 mm. lato, *nervis* vel simplicibus vel ramosis anastomosantibusque nec gibbosis, nervo dorsali fere recto vel plus minusve convexo, ventrali convexiore quam dorsali, *rostro* nonnunquam recto saepius tamen ad tergum deflexo. In Peruvia floret a Novembri ad Januarium, in Bolivia Novembri et Decembri et in Argentina a Septembri ad Decembrem.—PERU: *Soukup 140* (F); *Ball,* ex saxosis Andium, juxta pagum Chicla, 12–13,000 p. s. m., apr. 21–23, 1882 (NY). JUNIN: *Killip & Smith 22,125,* near Huancayo, open rocky hillside, herb to 5 ft., alt. 3300–3500 m., Apr. 26, 27, May, 25, 1929 (F, NY, US); *Kalenborn 94,* vicinity of Oroya, among rocks, alt. 10–17,000 ft., 1918–1919

(M, NY, US). LIMA: *Killip & Smith 21,753*, Rio Blanco, open hillside, herb 2–4 ft., alt. 3000–3500 m., Apr. 15–17, 1929 (NY, US); idem *21,752*, herb 1–2 ft. (F, NY, US). PAUCARTAMBO: *Herrera 1047a*, Hacienda Churu, alt. 3500 m., Jan., 1926 (US, TYPE; F, G, NY, ISOTYPES). CUZCO: *Pennell 13,540*, Quiquijana, grassy wayside, herb, alt. 3220 m., Apr. 23, 1925 (ANS, F); *Soukup 40*, Urubamba, entrada al valle Lares, Jan. 3, 1936 (F); *Vargas 702*, Hda Urco, alt. 2940 m., 1938 (F); *Herrera 829*, Sazaihuamán, hills, alt. 3200–3600 m., Dec., 1928 (F); *Soukup* 254, near Puno, alt. 4000 m., Jan., 1936 (F). BOLIVIA: *Kuntze*, alt. 3600 m., Apr. 1–4, 1892 (NY). COCHABAMBA: *Steinbach 8799*, valle de Cochabamba, alt. 2600 m., 27 Dez., 1928 (ANS). LA PAZ: *Buchtien 6239*, Cotaña am Illímani, an Wassergräben, alt. 2500 m., Nov., 1911 (F, US); *Bang 1314*, vic. Sorata, 1892 (ANS, F, G, NY, US); *Rusby 501*, Sorata, alt. 10,000 ft., 1886 (ANS, G, M, US). ARGENTINA, SALTA: *Eyerdam & Beetle 22,631*, 14 km. west of Manuela Pedraza, Tartagal river, moist sand, stream-bank, semi-shade, perennial herb 1–1.5 m., alt. 900 m., Oct. 26, 1938 (G). [N. B. This specimen is the only one complete with underground system, a tuber about 3 inches long.] TUCUMÁN: *Venturi 930*, dept. Tafi, Yerba Buena, en una quebrada con agua, altura de la planta 1 m., flor amarilla, alt. 700 m., Sept. 24, 1920 (F, M, US); *Venturi 3995*, dept. Chicligasta, Estancia Las Pavas, en los prados, flor amarilla, alt. 1700 m., Dic. 11, 1926 [or 1925?] (G, US); *Job 1425*, Clavillo de Aconquija, flor verde, alt. 2800 m., 1937 (NY). CATAMARCA: *Jörgensen 1304*, El Candado, alt. 2700 m., Oct. 2, 1916 (G, M). CÓRDOBA: *Hieronymus*, am Ufer des Rio Primero bei Córdoba, Nov. 17, 1877 (F, US); *Kurtz 2707*, Córdoba, Rio I Cerro del Pueblo, Nov. 29–30, 1885 (NY); *Job 429*, La Falda, Cerro El Charrito, alt. 950 m., Jan., 1936 (US); *Kurtz 342*, San Virente, in umbrosis humidis frequens, Oct. 11, 1884 (NY); *Burkart 7193*, La Redución, Córdoba, orilla de arroyos, hasta 2 m. de altura, Dec. 27, 1935 (G, US). FIG. 43, a and b.

This species is rather heterogenous but the herbarium material, although abundant, is rather unsatisfactory; most collections at hand are either unicates or made up of duplicates collected at different dates and localities; of a hundred or so herbarium sheets, only one had the underground system and even so it was damaged. Further segregations might well be possible, although I attempted it many times unsuccessfully.

44. T. **viridulum,** sp. nov. *Planta* viridula omnino glabra nullo modo glauca. *Folia* caulinaria perfecte 5-ternata, *petiolulis* rectis. *Flores* polygamo-monoici, plurimi perfecti, pauci masculi. *Sepala* viridula ca. 4 mm. longa. *Antherae* acumen 0.5–1.0 mm.

Stylus una cum stigmate 8–10 mm. *Carpella* matura nullo modo gibbosa, ca. 7 mm. longo, *stipite* 0.7–1.0 mm., ventre 5.0–5.5 mm. longo, 3.0–3.2 mm. lato, *nervis* lateralibus plus minusve ramosis anastomosantibusque, nervo dorsali basi parum concavo, apice fere recto, ventrali convexo, *rostro* ad ventrum deflexo. An floret Junio et Julio?—PANAMA, CHIRIQUÍ: *Seibert 204*, valley of the upper Rio Chiriquí Víejo, vicinity of Monte Lirio, growing in rocky gorge, 1–1.5 m. tall, fls. green, styles and stamens pinkish-lavender, alt. 1300–1900 m., June 27–July 13, 1935 (NY, TYPE; G, N-ND, ISOTYPES). FIG. 44.

45. T. PANAMENSE Standley, Field Mus. Nat. Hist. Pub. Bot. **22:** 19, 1940. *Planta* 6–12 dm., *caule* ramis petiolisque plus minusve glaucis, omnino pubescens. *Pubescentia* e pilis capitatis translucidis. *Folia* caulinaria 4–5-ternata. *Stylus* una cum stigmate ca. 8 mm. *Carpella* matura sigmoidea nec gibbosa, ca. 6.5 mm. longa, *stipite* ca. 1 mm. ventre ca. 4.5 mm. longo, 2.0–2.2 mm. lato, *nervis* lateralibus simplicibus vel parum ramosis, nervo dorsali baso concavo, apicali convexo, ventrali convexiore quam dorsali, *rostro* ad ventrum deflexo. An floret Junio?—PANAMA, CHIRIQUÍ: *Davidson 791*, Boquete, flowers greenish, 2 to 4 ft. high, alt. 4500 ft., June 26, 1938 (F, TYPE). FIG. 45.

46. T. **Macbrideanum,** sp. nov. *Planta* elata omnino glabra ad 12 dm. attingens et verosimiliter arcuans. *Caulis* subteres. *Folia* inflorescentiae estipellulata 3–4-ternata. *Inflorescentia* ampla paniculata (an secunda?), *ramis* divaricantibus incurvatis foliosis. *Pedunculi* 2–3 cm. ad aetatem florendi, 4–5 cm. et parum curvati cum fructus permatuerunt, nec sub receptaculum reflexi. *Flores* perfecti cum *staminibus* 16–20 et *pistillis* 3–6. *Sepala* quatuor, late ovalia, 5.0–6.5 mm. longa. *Stamina* filamento 6–8 mm., *antheris* 2.5 mm. oblongo-lanceolatis, *mucrone* 0.3–1.2 mm. longo. *Stylus* una cum stigmate 12–15 mm. nonnunquam persistens. *Carpella* matura valde compressa, fere laminaria, semi-orbicularia, nervosa, nec gibbosa, *stipite* ca. 2 mm., ventre ca. 4.5 mm. longo, ca. 2.5 mm. lato, *nervo* ventrali semi-circulari, dorsali subrecto, lateralibus conspicuis rugosis curvatis nec ramosis nec sinuosis, *rostro* ad tergum deflexo. Floret Junio.—PERU: *Macbride 4466*, Tambo de Vaca, June 10–24, 1923, in patches, to 4 ft. high, pistils purple, anthers yellow, alt. about 13,000 ft. (G, TYPE: F, NY, US, ISOTYPES). FIG. 46, a–d.

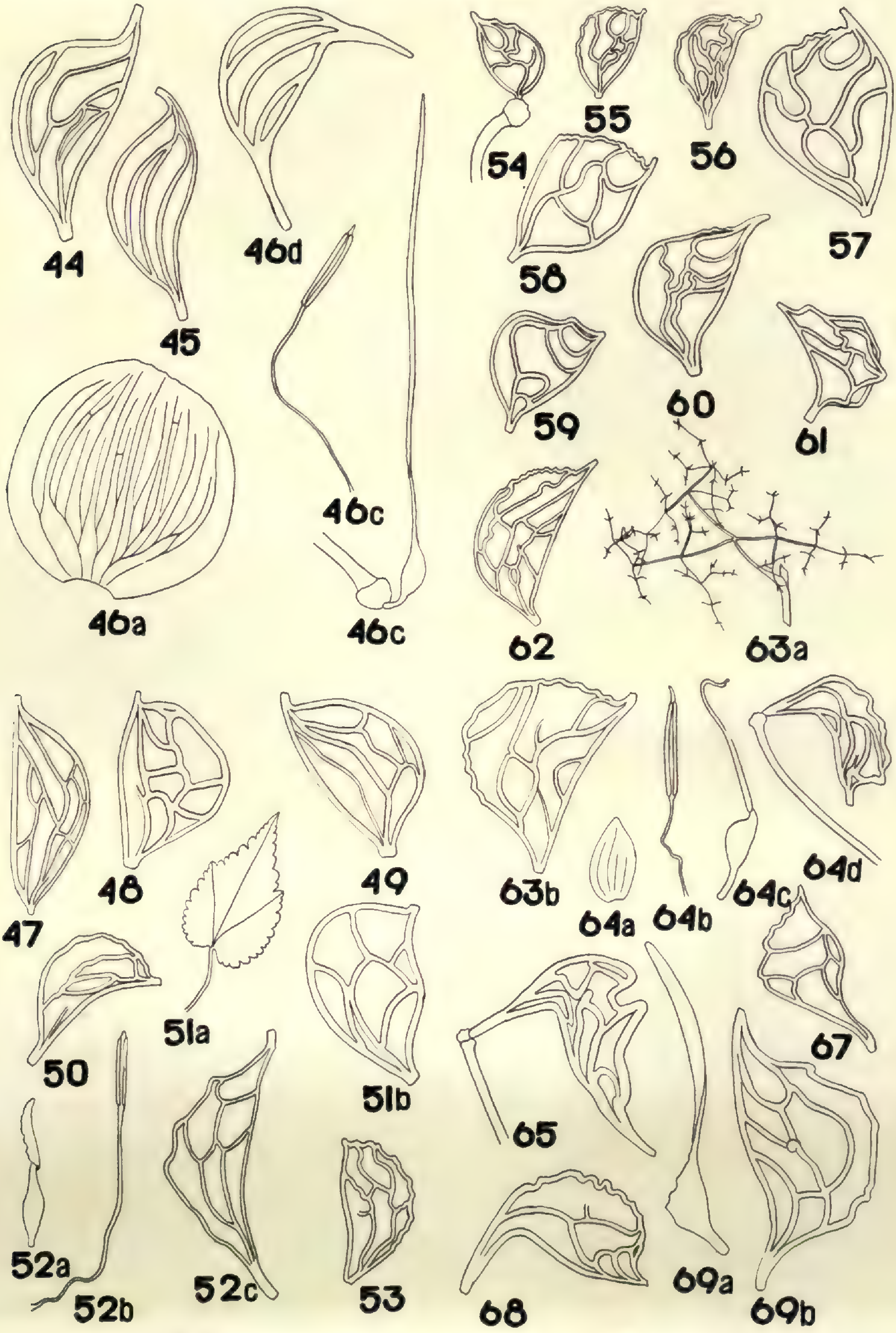
The type specimen is made up of three fragments evidently homogeneous, one with mature fruits, the second with half-open flowers, the third one larger, with flowers in full bloom. For this unusually fine herbarium specimen, we are thankful to the collector, J. FRANCIS MACBRIDE, and it is a pleasure to dedicate to him this new species. The length of the usually persistent

style sets this species apart from any other *Thalictrum* we know of. And before the stamens reach the length of the sepals, the style is already full grown.

47. T. **Deamii,** sp. nov. *Planta* omnino glabra. *Sepala* viridula ca. 25 mm. longa. *Filamenta* ca. 5 mm. *Antherae* ca. 4 mm., acumine ca. 0.5 mm. *Stylus* una cum stigmate 8.5–10.5 mm. *Carpella* matura ovato-lanceolata, 6.5–8.0 mm. longa, *stipite* usque ad 0.8 mm., ventre 6–7 mm. longo, ca. 2.5 mm. lato, *nervis* rugosissimis valde anastomosantibus parum undulatis nec tamen gibbosis, nervo dorsali fere recto vel parum convexo, ventrali convexiore quam dorsali. Tempus florendi ignotum.—Mexico, tamaulipas: *von Rozynski 558*, Sierra near San Lucas, Jamauve, July, 1932 (F, US). nuevo león: *Kenoyer 120*, Monterrey, field, Sept. 18, 1937 (F). san luis potosí: *Pringle 5071*, Las Canoas, June 23, 1891 (G, type). Fig. 47.

Dedicated to a botanist whom we admire very much for his patient and painstaking work, namely his herbarium specimens and his publications on the flora of Indiana. His Flora of Indiana contains the best key that was ever published to separate three very litigious species: *T. dasycarpum* Fisch. & Lall., *T. polygamum* Muhl. and *T. revolutum* DC.

48. T. grandifolium Watson, Proc. Am. Acad. **23:** 267, 1888, nec *T. grandifolium* Rose, Contrib. U. S. Nat. Herb. **5:** 143, 1897. *T. grandiflorum* Watson ex Rose, Contrib. U. S. Nat. Herb. **5:** 188, 1899, nec *T. grandiflorum* Maxim., Act. Hort. Petrop. **11:** 11, 1889, nec *T. grandiflorum* Rose, Contrib. U. S. Nat. Herb. **5:** 188, 1899.—*Planta* verosimiliter semimetralis ad sesquimetralis, saepius plus minusve glauca, omnino glabra nisi in *foliolis* infernis, tum pubescentia sparsa est e pilis crassiusculis brevibus opacis et coloratis. *Foliolae* variabiles ad 5 cm. longae et latae. *Petioli* foliorum caulinariarum saepius 2–6 cm., dilatatione petiolari exclusa. *Pedunculus* fructuum ad 6 cm. extendet, in primis parum incurvatus, in apicem valde recurvatus. *Flores* omnes perfecti (?) vel plurimi perfecti pauci masculi. *Sepala* 3–5 mm. longa. *Filamenta* 4.0–5.5 mm. *Antherae* 3.5–5.0 mm., acumine 0.5–1.5 mm. *Stylus* una cum stigmate 5–10 mm. *Carpella* matura substipitata, apice acuto vel saepius rotundo vel etiam prope rostrum retuso, 4.5–5.0 mm. longa, ventre ca. 4 mm. longo, 2.5–3.2 mm. lato, *nervis* valde ramosis anastomosantibusque nervo dorsali aliquid convexo, ventrali convexiore quam dorsali. Floret a Junio per Julium ad Augustum.—Mexico, chihuahua: *Pringle 1513*, Sierra Madre, under cliffs, Oct. 17, 1887 (G, type: ANS, CA, F, M, NY, UC, US, isotypes); *Nelson 6007*, in the Sierra Madre, June 21–July 29, 1899 (G, US); *Hartman 751*,



Details of Flowers or Fruits of Thalictrum, all × 4, except 51a and 63a, these × ⅕.

(For explanation see end of paper.)

Pilares, Strawberry Valley, Sept. 22, 1891 (G); *M. E. Jones*, Soldier Canyon, alt. 6500 ft., Sept. 16, 1903 (CA, F, M, NY, UC, US); *LeSueur 1323*, Rio Negro, Aug. 29, 1937 (F); *Townsend & Barber 47*, near Colonia Garcia, alt. 7500 ft., June 23, 1899 (F, G, M, NY, US). DURANGO: *E. Palmer 357*, Durango and vicinity, Apr. to Nov., 1896 (F, G, M, NY, UC, US). NUEVO LEÓN: *C. H. & M. T. Mueller 899*, Cieneguillas to Puerto Santa Ana, about 15 miles SW of Galeana, commonly scattered in dense moist wood, flower straw with lavender stamens, June 28, 1934 (F). SAN LUIS POTOSÍ: *Pennell 17,910*, Las Canoas, rocky limestone hill, flowers purplish, alt. 100–1200 m., Aug. 6–7, 1934 (ANS). Fig. 48.

49. T. Hernandezii Tausch ex Presl, Rel. Haenk. **2:** 69, 1835. *T. puberulum* Aschen ex Lecoyer, Bull. Soc. Bot. Belg. **24:** 306, 1885, nomen subnudum cum synonymis editum. *Planta* omnino glabra viridula nec glauca, metrum approximans. *Flores* polygamo-monoici, pauci masculi, alii perfecti. *Sepala* 3–4 mm. longa, nonnunquam viridula. *Filamenta* ca. 5 mm. *Antherae* 3–3.5 mm., *acumine* circa millimetrali. *Stylus* una cum stigmate 8.5–10.0 mm. *Carpella* matura glauca semiovata ca. 5 mm. longa, *stipite* 0.2–0.5 mm., ventre ca. 4.5 mm. longo, 3.3–3.6 mm. lato, *nervis* plus minusve ramosis anastomosantibusque, nervo dorsali paululo convexo, ventrali conspicue convexiore quam dorsali. Floret Julio.—Mexico, GUERRERO: *R. Q. Abbott 145*, Taxco, rank-growing, in damp or shady places, 1 meter or so tall, July 18, 1936 (G); idem, *237* and *238*, July 12, 1937 (G). Fig. 49.

The application of this specific name is not quite certain. It might well apply to *T. gibbosum* Lec. I have not seen the type, which is at Prague in the herbarium of the Museum. Lecoyer had not seen it either, but Dr. M. Willkomm studied it for him. The original description refers to a glabrous plant two feet high, from western Mexico, with ternate leaves, dioecious flowers and the nerves of the fruits oblique and uneven. There is no such *Thalictrum* amongst the thousands of specimens at hand. If the dioecious character is discarded, then it may be either *T. gibbosum* Lec. or the species just described above. Presumably Lecoyer had studied *T. Hernandezii* Tausch carefully enough to ascertain that it was not the same thing as his own *T. gibbosum.* Sensu Lecoyer, *T. Hernandezii* is what I am calling *T. Nelsonii* or *T. strigillosum.* I cannot agree with his interpretation, for Tausch very clearly says: "Caulis . . . una cum foliis floribusque glaber".

Subsectio **Gibbosa,** subsect. nov. Sect. *Camptogastrum,* d. *Podocarpa* PRANTL, Nat. Pfl., **3,** 2: 66, 1888. *Plantae* glabrae vel pubescentes. *Ovaria* 10 vel pauciora in flore. *Carpella* matura compressa nervis ramosis anastomosantibusque saepius sinuosis et reticulatis, *nervo* ventrali, licet dorsali lateralibusque, gibbosis. Species typica *Thalictrum gibbosum* Lec. sit.

50. T. PACHUENSE Rose, Contrib. U. S. Nat. Herb. **5:** 188, 1899. *Planta* 20–50 cm., *radicibus* fibrosis, nonnullis istorum parum in locis incrassatis. *Caulis* basis subterraneus directus aphyllus, ad transitionem saepius ramosus et *foliis* numerosis munitus. Caulis aerius nonnunquam aphyllus, frequentius tamen cum folio caulinari solitario et cum 1–3 foliis inflorescentiae. *Pubescentia* deest, nisi interdum inferne, si adest e pilis incrassatis brevibus coloratis et in fructubus e pilis capitatis minutissimis translucidis. *Foliolae* 1 cm. longae vel minores. *Inflorescentia* reducta. *Pedunculi,* fructubus maturis, paululum incurvati et sub receptaculo maxime recurvati. *Flores* omnes perfecti purpurascentes. *Sepala* 3–4 mm. longa. *Filamenta* 5–6 mm. *Antherae* 2.5–4.0 mm., *acumine* 0.2–0.5 mm. *Stylus* una cum stigmate 5–9 mm. *Carpella* matura 4–5 mm. longa, oblique clavata, interdum parum gibbosa, *stipite* 0.5–1.5 mm., ventre 3.4–3.6 mm. longo, 1.6–2.0 mm. lato, *nervis* undulatis ramosis anastomosantibusque, nervo dorsali concavo. Floret Julio Augustoque.—MEXICO, HIDALGO: *Pringle 6880,* Sierra de Pachuca, open woods, alt. 9000 ft., July 16, 1898 (US, TYPE; ANS, F, G, M, NY, UC, US, ISOTYPES); *Pringle 9678,* Sierra de Pachuca, alt. 9500 ft., Aug. 22, 1902 (F, G, M, NY, US); *Rose & Hay 5585,* Sierra de Pachuca, July 21 & 22, 1901 (US). Type not seen, stored away. FIG. 50.

51. T. STANDLEYI Steyermark, Field Mus. Nat. Hist. Pub. Bot. **22:** 229, 1940. *Planta* 1–3 m. pubescens nisi in floribus et in foliolis supernis. *Pubescentia* e pilis saepius brunneis interdum translucidis, aliis uniseriatis aliis stellatis stipitatisque. *Folia* 2–4-ternata. *Foliolae* profunde cordatae, apice acuminatae, saepius parum asymmetricae, raro trilobatae, per marginem totam dentatae, dentibus serratis apice rotundis mucronulatis, sinubus acutissimis. *Pedunculi* variis modis recurvati. *Flores* polygamo-monoici, alii perfecti, alii masculi. *Sepala* oblonga 6.0–7.5 mm. longa. *Filamenta* 7–8 mm. *Antherae* 4.0–4.5 mm., *acumine* 0.6–0.8 mm. *Stylus* una cum stigmate 9–11 mm. *Carpella* matura viridia carnosa obovata 4.5–5.5 mm. longa, *stipite* 0.2–1.0 mm., ventre 4.0–4.5 mm. longo, 2.5–3.0 mm. lato, *nervis* obscuris copiose anastomosantibus, nervo dorsali ad basem et superne paululum concavo, ad medias parum convexo, ventrali valde convexo. *Rostrum* dorsale ad superas insertum et deflexum ad tergum. Floret Februario et Martio.—GUATEMALA, SAN MARCOS: *Standley 86,335,* Barranco Eminencia, road be-

tween San Marcos and San Raphael Pie de la Cuesta, in upper part of the barranco between Finca La Lucha et Buena Vista, wet wooded quebrada, herb 1 m. tall, rare, alt. 2500–2700 m., Feb. 6, 1941 (F); *Steyermark 26,358*, Río Vega, near San Rafael and Guatemala-Mexico boundary, Volcán Tacaná, herb 5–8 ft. tall, leaves dull green above, grass-green beneath and rugose, sepals green, at base purplish, anthers pale yellow turning purplish, filaments light green, style purple, sepals erect, anthers expanding first, the pistils later, flowers polygamo-monoecious, stem-nodes purplish, alt. 2500–3000 m., Feb. 20, 1940 (F, type); *Steyermark 37,067*, trail between Finca el Porvenir and San Sebastián, Volcán Tajumulco, alt. 1300–1400 m., March 1, 1940 (F, paratype); *Steyermark 36,821*, between town of Tajumulco and Tecutla (9 miles south and west of Tajumulco), northwestern slopes of Volcán Tajumulco, shaded thickets along quebrada, near top of barranco, herb 5–8 ft. tall, leaves membranaceous, rich green above, gray beneath, alt. 1800–2500 m., Feb. 27, 1940 (F, paratype). quezaltenango: *Standley 66,346*, mountains southeast of Palestina, damp dense forest, herb 5 ft., alt. about 2700 m., Feb. 22, 1939 (F, paratype); *Standley 66,338*, mountains southeast of Palestina, damp dense forest, tall coarse herb, alt. about 2700 m., Feb. 22, 1939 (F, paratypes); *Standley 84,240*, mountains southeast of Palestina, on old road to San Juan Ostuncalco, damp sandy hillside forest, herb 1–2 m. tall, common, alt. 2550–2850 m., Jan. 21, 1941 (F); idem *84,253* (F); *Standley 84,271*, mountains southeast of Palestina, on old road to San Juan Ostuncalco, damp sandy hillside forest, herb 1–1.5 m. tall, Jan. 21, 1941 (F). Fig. 51, a and b.

52. T. Johnstonii Standley & Steyermark, Field Mus. Nat. Hist. Pub. Bot. **22:** 229, 1940. *Planta* omnino glabra, 6 dm. alta vel altior. *Florum* plurimi perfecti, pauci masculi. *Sepala* 2.5–4.5 mm. longa. *Filamenta* 7–10 mm. *Antherae* 1.2–3.5 mm., *acumine* 0–0.2 mm. *Stylus* una cum stigmate anguste bialato 2–4 mm. *Carpella* matura ignota, fere matura 6–7 mm. longa, *stipite* ca. 1 mm., *nervis* lateralibus valde reticulatis, nervo dorsali paululum concavo, ventrali gibboso. Floret Majo et Junio. Guatemala, huehuetenango: *C. & E. Seler 2935*, Facaltenango, 21 juni 1896 (G, NY, US). el quiché: *Heyde & Lux 2977*, Nebaj, alt. 6000 p., maj. 1892 (G, NY, US). san marcos: *Salas 368*, "Culantro de monte", San Cristobal Cucho, alt. 1920 m., June, 1923 (US). chimaltenango: *J. R. Johnston 1643*, Desconsuelo, June 20, 1940 (F, type). Fig. 52, a–c.

53. T. lanatum Lecoyer, Bull. Soc. Bot. Belg. **24:** 122, 1885. *Planta* omnino pubescens nisi per foliolas supernas et in floribus. *Pubescentia* e pilis 1–4 mm. flexuosis acicularibus opacis, densissimis in caule. Carpellorum tamen pubescentia e pilis capitatis translucidis sparsis. *Radix* fibrosa. *Flores* polygamo-monoici,

alii perfecti, alii masculi. *Sepala* 3.2–4.5 mm. *Filamenta* 3.5–6.0 mm. *Antherae* 2.5–4.0 mm., *acumine* 0.5–0.7 mm. *Stylus* una stigmate 3.5–8.0 mm. *Carpella* matura sessilia gibbosa ca. 3 mm. longa, ca. 1.8 mm. lata, *nervis* sinuosis reticulatisque, nervo dorsali fere recto vel concavo. Floret Majo et Junio.—MEXICO, PUEBLA: *Purpus 2714*, Cerro de Gentile, southwest Puebla, rocks, Aug., 1907 (UC). OAXACA: *Purpus 2714*♂, vicinity of San Luis Tultitlanapa, Las Naranjos, May, 1908 (F, G, M, NY, UC, US); *Galeotti 4575*, Oaxaca (syntype in the Paris Herbarium; F, photograph of this syntype); *Conzatti & Gonzalez 1208*, Huauchilla, alt. 2500 m., June 1901 (G); *Conzatti 1795*, Lomerios de San Felipe, Oaxaca, alt. 1700 m., junio 9, 1907 (F). FIG. 53.

The pubescence is longer than in any other species of *Thalictrum*. The fruits of *T. lanatum*, *T. parvifructum* and *T. Pennellii* are the smallest in this section of the genus. Other syntypes are *Galeotti 4548* pro parte, from Sola, and *Andrieux 1834*, from Mitla. Nothing of those two has been seen by me.

54. T. **Pennellii,** sp. nov. *Planta* verosimiliter submetralis, caule basi, foliolis superne et floribus exceptis, pubescens. *Pubescentia* translucida minutissima e pilis capitatis per foliolarum paginam inferiorem, alio translucida densa e pilis uniseriatis. *Radices* ignotae. *Pedicelli* directi centimetrales, attamen sub receptaculum recurvati. *Carpella* matura glabra, subsessilia refracta ovata, ca. 3 mm. longa, ca. 1.8 mm. lata, apice acutorostrata, *nervis* lateralibus ramosis et anastomosantibus, nervo dorsali convexo, ventrali convexiore quam dorsali et saepius gibboso quidem. Tempus florendi ignotum, item flores.—MEXICO, DURANGO: *Pennell 18,505*, El Salto, Aserraderos, rocky, andesitic, pineland canyon, alt. 2500–2530 m., Aug. 31, 1934 (ANS, TYPE). FIG. 54.

Dedicated to Dr. FRANCIS W. PENNELL of the Academy of Natural Sciences of Philadelphia.

55. T. **parvifructum,** sp. nov. *Planta* 3–5 dm., pubescens saepius per foliolas inferne, nunquam superne, interdum aliis locis. *Pubescentia* pilorum crassiusculorum opacorum coloratorum nonnunquam cum pilis capitatis translucidis intermixtorum. *Flores* polygamo-monoici. *Sepala* elliptica ca. 3 mm. longa. *Filamenta* ca. 3 mm. *Antherae* 2.5–3.0 mm., *acumine* 0.2–0.4 mm. *Stylus* una cum stigmate 3.0–5.5 mm. *Carpella* matura rostrata glabra obovata subsessilia 2.7–3.0 mm. longa, 1.6–1.8 mm. lata, *nervis* lateralibus ramosis undulatis anastomosantibusque, nervo dorsali convexo, ventrali convexiore quam dorsali et gibboso. Floret Julii mense.—MEXICO, SONORA: *Pennell*

19,555, ridge south of Arroyo Gochico, east of San Bernardo, base of cliff near summit, alt. 1050–1150 m., Aug. 5–9, 1935 (ANS, TYPE); *Gentry 1463*, Rio Mayo, Bakachaka, upper Sonorian, riparian, inconspicuous along the stream bank, a tolerant herb, July 5, 1935 (ANS, F, G, M, NY, UC, US). FIG. 55.

56. T. STRIGILLOSUM Hemsley, Diag. Pl. Nov. **1**, 1878. *T. papillosum* Rose, Contrib. U. S. Nat. Herb. **5:** 188, 1899. *T. jalapense* Rose, Contrib. U. S. Nat. Herb. **8:** 28, 1903. *Planta* nonnunquam omnino pubescens 2–10 dm. *Pubescentia* varia variabilisque semper tamen densa inferne in foliolis. Pubescentia caulinaris, si adest, vel e pilis capitatis, vel e pilis millimetralibus flexuosis acicularibus opacis, vel iisdem intermixtis. Pubescentia foliolarum superne e pilis capitatis cum adest, inferne e pilis crassiusculis brevibus coloratis densissimis, nonnunquam pilis capitatis intermixtis. Pubescentia carpellorum vel deest vel e pilis capitatis translucidis. *Radices* fibrosae. *Pedicelli* parum incurvati, sub fructum valde recurvati. *Flores* plurimi perfecti pauci masculi. *Sepala* 3.0–6.5 mm. longa. *Filamenta* 4.5–6.0 mm. *Antherae* 2.5–4.0 mm., *acumine* 0.4–0.5 mm. *Stylus* una cum stigmate 5–13 mm. *Carpella* matura 3.5–4.5 mm. longa, *stipite* 0.3–1.0 mm., ventre 2.5–4.0 mm. longo, 1.6–2.2 mm. lato, *nervis* gibbosis reticulatis, nervo dorsali fere recto, vel parum convexo, saepius tamen paululum concavo. Floret Majo, Junio, Julio et Augusto.—MEXICO, COAHUILA: *E. Palmer, 9*, Lerios, Feb. to Oct. 1880 (ANS, US); *Gregg 404*, near Saltillo, San Antonio, Sept. 2, 1848 (M). SAN LUIS POTOSÍ: *Purpus 5361*, Minas de San Rafael, May, 1911 (F, M, NY, UC). ZACATECAS: *Rose 2658*, near Monte Escobede, Aug. 27, 1897 (US, type of *T. papillosum;* G, US, isotypes). VERA CRUZ: *Rose & Hay 5674*, Mount Orizaba, July 25 and 26, 1901 (NY, US); *Rose & Hay 6188*, near Jalapa, Aug. 17, 1901 (US, type of *T. jalapense;* G, US, isotypes). HIDALGO: *Coulter 652*, Zimapan (G); *Purpus*, Ixmiquilpan, Sierra de la Mesa, July, 1905 (UC); *Clokey 1855*, Real del Monte, bank of stream, Oct. 1, 1910 (M, C-UC); *Pringle 6929*, Sierra de Pachuca, alt. 9000 ft., July 28, 1898 (ANS, F, G, M, NY, UC, US). MEXICO and DISTRITO FEDERAL: *Rose, Painter & Rose 8440*, Hacienda de la Encarnacion, July 7, 1905 (G, NY, US); *Rose & Painter 7185*, near Cima, Sept. 19, 1903 (G, NY, US); *Pringle 6422*, valley of Mexico, Pedrigal (lava beds), 1–3 ft., alt. 7800 ft., Aug., 1896 (ANS, F, G, M, NY, UC, US); *Schaffner 11*, vallée de Mexico, 1870–1880 (G, NY); *Mexia 2685*, Monte de Rio Frio, kilometer 49, road from Mexico City to Puebla, pine forest on slopes, in shade of thick pines, suffrutescent, spreading, up to 1 m., flowers yellowish, alt. 4000 m., July 31, 1929 (F, M, NY, UC); *Bourgeau 276*, vallée de Mexico, juin, 1865–66 (G, US, syntypes of *T. strigillosum*). MICHOACÁN: Arsène 5677, vicinity of Morelia, alt. 2800 m., 1910 (US).

The type of this species has not been selected. Other syntypes, not seen, are *Andrieux 546* and *Schaffner's* collection from Tacubaya. The types of the two species given as synonyms have not been seen either, but isotypes of both were available for study. FIG. 56.

Except as to the type of pubescence and the size of the fruit, there is not much difference between *T. strigillosum* Hemsl. and *T. lanatum* Lec. They have, however, different ranges.

57. T. **laeteviride,** sp. nov. *Planta* 3–12 dm., omnino pubescens nisi in foliolis superne et in floribus. *Pubescentia* e pilis capitatis translucidis interdum tamen intermixtis in foliolis infernis cum pilis opacis brevibus capitatis. *Radices* fibrosae. *Pedunculi* parum incurvati sub fructum valde recurvatum. *Sepala* viridula ca. 3 mm. longa. *Antherae* 2–3 mm., *acumine* 0.3–0.4 mm. *Stylus* una stigmate 6–10 mm. *Carpella* matura sessilia 5.0–5.5 mm. longa, 3.5–3.8 mm. lata, *nervis* ramosis et reticulatis, nervo dorsali convexo, ventrali gibboso convexiore quam dorsali, *rostro* ad frontem deflexo. Floret Julio et Augusto. —MEXICO, COAHUILA: *Johnston & Muller 463*, Sierra del Pino, vicinity of La Noria, open valley with scrub oaks and scattered pines, shaded arroyo-banks, 1–4 ft. tall,, Aug. 20–26, 1940 (G, TYPE); *Stanford, Retherford & Northcraft 387*, lat. 25° 3′, long. 101° 18′, in arroyo on south slope of mountain, 24 kilo. northwest of Fraile, great variation of vegetation with many vines and other types of more southerly plants, plant 18–24 inches tall, alt. 2900 m., July 15, 1941 (G, M); *R. M. Stewart 2291*, north of La Noria, high central parts of the calcareous Sierra del Pino, north of high eastern ridges, frequent on open sunny slopes, becoming 8 dm. tall, Aug. 26, 1942 (G). FIG. 57.

58. T. LASIOSTYLUM Presl, Rel. Haenk. **2:** 70, 1835. *Planta* 40–65 cm. glabra nisi in foliolis inferne. *Pubescentia* sparsa e pilis crassiusculis coloratis brevibus. *Radix* ignota. *Flores* verosimiliter polygamo-monoici. *Stylus* una cum stigmate 5.0–6.5 mm. long. *Carpella* matura 5.0–6.5 mm. longa, *stipite* 0.5–1.0 mm., ventre 4–5 mm. longo, 3.0–3.5 mm. lato, *nervis* lateralibus sinuosis reticulatisque, nervo dorsali fere recto vel convexo, ventrali gibboso et convexiore quam dorsali. Tempus florendi mihi ignotum est.—PERU, LIMA: *Macbride & Featherstone 269*, Matucana, perennial among large granite rocks on steep northern canyon slope, about 8000 ft., Apr. 12–May 3, 1922 (F, NY); *Pennell 14,338*, Canta, open rocky slope, herb, alt. 2700–3200 m., June 11–19, 1925 (ANS, F, G). FIG. 58.

Type, not seen, in the herbarium of the Botanical Garden at Prague. Lecoyer assumed this specimen to have been errone-

ously attributed to Peru, that it was a Mexican specimen of *T. Hernandezii* Tausch. Indeed he had no other collection of *T. lasiostylum* Presl from Peru and both species are no doubt closely related. But as we have now two other collections it becomes clear that they are probably different enough to be kept specifically segregated.

59. T. SUBPUBESCENS Rose, Contrib. U. S. Nat. Herb. **8:** 28, 1903. *Planta* submetralis vel sesquimetralis per foliolas inferne pubescens, aliis locis nunc glabra tum pubescens. *Pubescentia* densa e pilis capitatis translucidis. *Flores* polygamo-monoici, plurimi perfecti, pauci masculi. *Sepala* 3.8–4.5 mm. longa. *Filamenta* 5–6 mm. *Antherae* 2.8–3.5 mm., *acumine* 0.2–0.4 mm. *Stylus* una cum stigmate 7–10 mm. *Carpella* matura 4–5 mm. long., 2.3–2.9 mm. lat., *stipite* 0.5 mm. vel breviore vel deente, *nervis* lateralibus ramosis reticulatisque, nervo dorsali fere recto vel parum convexo, ventrali gibboso convexiore quam dorsali. Floret Julio et Augusto.—MEXICO, MEXICO: *Pringle 1896*, Sierra de las Cruces, moist banks, 3–5 ft., alt. 10,000 ft., Aug. 14, 1896 (US, TYPE; ANS, F, G, M, NY, UC, US, ISOTYPES); *Pringle 11,917*, bluffs of barranca below Ozymba, alt. 8000 ft., Sept. 24, 1904 (F, G, US). FIG. 59.

Type not seen, but there is an abundance of isotypes at hand.

60. T. PUBIGERUM Bentham, Pl. Hartw., **3:** 285, 1857. *T. tomentellum* Robinson & Seaton, Proc. Am. Acad. **28:** 103, 1893. *Planta* submetralis vel subbimetralis omnino pubescens. *Pubescentia* e pilis uniseriatis translucidis densissimis. *Radices* fibrosae in locis paululum tuberosae. *Folia* caulinaria petiolis 2–8 cm., dilatatione petiolari exclusa. *Sepala* 3.7–4.5 mm. longa. *Filamenta* 4.5–6.5 mm. *Antherae* 2.0–3.5 mm., *acumine* 0.5–0.7 mm. *Stylus* una cum stigmate 5–7 mm. *Carpella* matura pubescentia, 3.5–5.0 mm. longa, 2.0–2.5 mm. lata, *stipite* 0–0.5 mm., *nervis* rugosis sinuosis reticulatisque, nervo dorsali parum convexo, ventrali convexiore quam dorsali. Floret Majo, Junio et Julio. —MEXICO: *T. C. & E. M. Frye 2640*, Laventa, Desierto de los Liones, alt. 3000 m., May 20, 1939 (M, NY, C-UC); *Plunkett 26*, Desert of the Lions, along stream, 3–6 ft. tall, July 8, 1932 (F). JALISCO: *Pringle 9679*, slopes of the barranca of Guadalajara, alt. 5000 ft., July 16, 1902 (F, G, M, NY, US); *Pringle 2479*, hillsides near Guadalajara, June 29, 1889 (ANS, F, G, M, NY, UC, US); *Rose & Painter 7360*, near Guadalajara, Sept. 28, 1903 (US); *Rose & Hough 4744*, near Tequila, July 5 and 6, 1899 (G, NY, UC, US). HIDALGO: *Pringle 7489*, valley near Tula, June 24, 1897 (G). MICHOACAN: *Pringle 4143*, low lands about Lake Patzcuaro, July 15, 1892 (G, type of *T. tomentellum;* ANS, F, M, NY, UC, US, isotypes). FIG. 60.

The TYPE of *T. pubigerum* Benth. is *Hartweg 1591, ad fluviorum margines prope Lagos.* It has not been seen.

61. T. **Conzattii,** sp. nov. *Planta* metralis omnino pubescens, nisi in carpellis. *Pubescentia* e pilis uniseriatis translucidis. *Flores* polygamo-monoici, plurimi perfecti, pauci masculi. *Sepala* 2.8–3.5 mm. longa. *Filamenta* 3.5–4.0 mm. *Antherae* 2.0–3.3 mm., *acumine* 0.3–0.7 mm. *Stylus* una cum stigmate 5.0–6.0 mm. *Carpella* matura glabra 3.5–4.5 mm. longa, *stipite* ca. 0.5 mm., ventre 2.9–3.5 mm. longo, 1.8–2.2 mm. lato, nervo ventrali gibboso, lateralibus gibbosioribus et reticulatis, dorsali paululum concavo, vel subrecto. Floret Julio et Augusto.—MEXICO: VERA CRUZ: *Bourgeau 2726,* région d'Orizaba, 17 juillet, 1865–1866 (G); *G. L. Fisher 293,* Orizaba, alt. 4500 m., Aug. 9, 1924 (F, M, US); *Müller,* Orizaba, 1855 (NY); *Mohr,* Huatusco, July, 1857 (US); *Mohr,* Orizaba, in pratis et graminosis, sylvaticis (ANS); *Mohr,* Orizaba, julio, 1857 (US); *Mohr,* Orizaba, in sylvis montanis ad saxas calcares, julio, 1856 (US). MEXICO and DISTRITO FEDERAL: *Hinton 4200,* distr. Temascaltepec, Comunidad, alt. 2480 m., July 6, 1933 (M); *Hinton 3851,* Temascaltepec, Comunidad, by the river, alt. 2480 m., Aug. 5, 1933 (G, NY); *Langman 2509,* ¼ mile s. of Contadero, thickly wooded slopes, July 27, 1940 (ANS). OAXACA: *Conzatti & Gonzalez 314,* Etla, Canada de San Gabriel, alt. 3000 m., Aug. 8, 1897 (G, TYPE; US, ISOTYPE). FIG. 61.

62. T. **sessilifolium,** sp. nov. *Planta* metralis vel altior omnino pubescens. *Pubescentia* e pilis uniseriatis translucidis. *Folia* caulinaria sessilia vel fere sessilia in apice dilatationis petiolaris. *Sepala* 4.2–5.0 mm. *Filamenta* 6.0–7.5 mm. *Antherae* 2.6–6.5 mm., *acumine* 1.0–1.2 mm. *Stylus* una cum stigmate 5–12 mm. *Carpella* matura pubescentia, 5–6 mm. longa, ca. 2.5 mm. lata, *stipite* 0–1 mm., *nervis* lateralibus valde reticulatis, nervo ventrali gibboso, dorsali suberecto vel concavo. Floret Majo, Junio, Julio et Augusto.—MEXICO, MEXICO: *Harshberger 76,* Salaza, Sierra de las Cruces, alt. 11,000 ft., Aug. 13, 1896 (M, TYPE; ANS, G, NY, US, ISOTYPES). MICHOACAN: *Leavenworth 250,* west of Tancitaro, on edge of arroyo, herb 5–7 ft., alt. 6660 ft., July 15, 1940 (F, M, NY). PUEBLA: *Nicolas,* rancho Posadas, Hacienda Alamos, 1 août, 1909 (F, NY, US); *Arsène & Nicolas 5168,* près Puebla, Hacienda Noria, sur l'Atoyae, alt. 2170 m., 20 mai, 1910 (G, M, NY). FIG. 62.

63. T. **refractum,** sp. nov. *Planta* glabra metralis vel sesquimetralis. *Radices* fibrosae. *Rami petiolorum* paululum incurvati valde divaricati, saepius refracti. *Flores* polygamimonoici, plurimi perfecti, pauci masculi. *Sepala* 2.5–4.5 mm. *Filamenta* ca. 5 mm. *Antherae* 1.8–3.0 mm., *acumine* 0.5–1.0 mm. *Stylus* una cum stigmate 5–10 mm. *Carpella* matura

6.0–6.5 mm., *stipite* 0.5–1.0 mm., ventre 4–5 mm. longo, 3.0–3.2 mm. lato, *nervis* lateralibus sinuosis reticulatisque, nervo dorsali parum concavo, ventrali gibboso valde convexo. Floret a mense Junii usque ad Octobris.—Colombia, cundinamarca: *Cuatrecasas 9664*, Cordilleria Oriental, vertiente oriental, cerca de Machetá, hierba de 1 metro, calis verde blanquecino con venas violáceas, antheras amarillas, alt. 2200 m., June 29, 1940 (US, type); *Pennell 2398*, 2–3 m. sw. of Sibate, fl. purplish-green, alt. 2700–2800 m., Oct. 13–15, 1917 (G, NY, US). Fig. 63, a and b.

64. T. peninsulare (Brandegee) Rose, Contrib. U. S. Nat. Herb. **8:** 28, 1903. *T. vesiculosum* Lec., var. *peninsulare* Brandegee, Zoe, **4:** 399, 1894. *Planta* omnino glabra submetralis. *Radices* fibrosae. *Foliolae* membranaceae discolores, saepius trilobatae, basi cuneatae raro rotundae. *Flores* polygamo-monoici. *Sepala* 2.5–3.5 mm. long. *Filamenta* 3–6 mm. *Antherae* 3.0–3.5 mm., *acumine* 0.5–0.8 mm. Ovarii *stipes* 0.5–1.0 mm. *Stylus* una cum stigmate 5–8 mm. *Carpella* matura gibbosa 4–6 mm. longa, *stipite* 1–3 mm., ventre 3–4 mm. longo, 1.8–2.0 mm. lato, *nervis* lateralibus gibbosis ramosis anastomosantibusque, nervo dorsali basi concavo, superne convexo, nervo ventrali convexo et gibboso. Floret Septembris mense. An etiam Augusti?—Mexico, baja california: *Brandegee*, Saltillo, Sept. 17, 1893 (UC, type and isotype); *Brandegee*, El Taste, Sept. 13, 1893 (G, NY, US, paratypes); *Brandegee*, Sierra de San Francisquito, Oct. 18, 1890 (UC); *Brandegee*, Sierra de Laguna, Jan. 23, 1890 (UC); *M. E. Jones 27,027*, Laguna Mountains, The Laguna, Sept. 22, 1930 (G, M, NY, UC, US); *Nelson & Goldman 7470*, from La Laguna to El Paraiso, alt. 5000–5800 ft., Jan. 29, 1906 (US). Fig. 64, a–d.

65. T. gibbosum Lecoyer, Bull. Soc. Bot. Belg. **24:** 132, 1885. *T. grandifolium* Rose, Contrib. U. S. Nat. Herb. **5:** 143, 1897, nec *T. grandifolium* Watson, Proc. Am. Acad. **23:** 267, 1888; *T. grandiflorum* Rose, Contrib. U. S. Nat. Herb. **5:** 188, 1899; nec Watson ut in Rose, Contrib. U. S. Nat. Herb. **5:** 144, 1897, nec *T. grandiflorum* Maxim., Act. Hort. Petrop. **11:** 11, 1889. *T. obliquum* Rose, Contrib. U. S. Nat. Herb. **8:** 27, 1903. *T. stipitatum* Rose, Contrib. U. S. Nat. Herb. **8:** 28, 1903, nec *T. stipitatum* Rydb., Fl. Rocky Mts. 290, 1918. *Planta* metralis vel trimetralis, omnino glabra, plus minusve glauca. *Radices* fibrosae. *Flores* polygamo-monoici, plurimi perfecti, pauci masculi. *Sepala* 3–5 mm. longa. *Filamenta* 3.5–6.0 mm. longa. *Antherae* 2–5 mm. *Stylus* una cum stigmate 5–14 mm. *Carpella* matura plus minusve gibbosa, 4–8 mm. longa, *stipite* 0.5–2.0 mm., ventre 4.0–5.5 mm. longo, 2–3 mm. lato, *nervis* ramosis et anastomosantibus, nervo dorsali basi concavo, superne convexo, nervo ventrali gibboso. Floret a Maji mense usque ad Novem-

bris.—MEXICO, MEXICO and DISTRITO FEDERAL: *G. L. Fisher 394*, Amecameca, July 24, 1924 (F, M, US); *Hinton et al. 6412*, dist. Temascaltepec, Crucero, 1.5 m. high, Aug. 28, 1934 (F, G, NY, US); *Hinton 5283*, dist. Temascaltepec, La Labor, oak woods, alt. 2100 m., Nov. 30, 1933 (M); *O. Kuntze 23,655*, Amecameca, alt. 8600 ft., Aug., 1904 (NY). MORELOS: *G. L. Fisher 35,229*, Tepoztlan, alt. 7500 ft., July 14, 1935 (F, NY, US); *Lyonnet 584*, Huizilac, Aug. 1930 (G, M, NY, US); *Rose & Painter 6966*, near Cuernavaca, Sept. 10, 1903 (NY, US); *Rose & Rose 11,121*, near El Parque, Aug. 15, 1906 (US); *Pringle 11,338*, near Cuernavaca, Gautepec, limestone hills, alt. 4000 ft., Oct. 27, 1902 (G, US); *Pringle 11,915*, Cuernavaca, barranca bluffs, 4–6 ft., alt. 5000 ft., July 20, 1904 (F, G, US); *Pringle 13,771*, Cuernavaca, wet places, 4–6 ft., alt. 5000 ft., July, 1906 (G, US); *Pringle 6511*, wet barranca above Cuernavaca, 6–10 ft., alt. 6500 ft., Sept. 21, 1896 (US, type of *T. stipitatum* Rose; ANS, F, G, M, NY, UC, US, isotypes); *Pringle 6392*, near Cuernavaca, wet shaded places, five to eight feet high, stem leaves four to six, alt. 5000 ft., July 28, 1896 (US, type of *T. grandifolium* Rose and *T. grandiflorum* Rose; ANS, F, G, M, NY, UC, US, isotypes). PUEBLA: *Amable & Arsène 2022*, dist. Tepeaca, Acatzinco, alt. 2110 m., julio 1907 (US); *Arsène 1445*, près Puebla, barranca de l'Alseseca, Hacienda de Batan, près de Totimehuacan, alt. 2120 m., June 13, 1907 (G, US); *Arsène 2258*, dist. Tepeacan, La Barranquilla, alt. 2110 m., July, 1907 (M, US); *Pringle 9541*, Amozoc, bluffs of gulches, alt. 7000 ft., Sept. 10, 1901 (US, type of *T. obliquum;* F, G, M, isotypes). OAXACA: *Galeotti* 4549 pro parte, Juquila del Sur (Paris Museum, TYPE of *T. gibbosum;* F, photograph of the type); *Pringle 5821*, cuesta de San Juan del Estado, Aug. 20, 1894 (G); *E. W. Nelson 1579*, valley of Oaxaca, alt. 6500–7800 ft., Oct. 3, 1894 (US). FIG. 65.

The types of none of the species listed above have been seen. However, I have at hand a photograph of one of them, furnished by the Field Museum, and numerous isotypes of the others. The material listed under the name *T. gibbosum* Lec., is fairly heterogeneous, but all attempts to segregate it along satisfactory lines have been unsuccessful.

66. T. LONGISTYLUM HBK. ex DC. Syst. **1:** 171, 1817. *Planta* 12 dm., glabra nisi per foliolas inferne. *Pubescentia* sparsa e pilis crassiusculis, brevibus, opacis. *Caulis* teres flexuosus *nodis* inflatis, sulcatus, validissimus tamen nec facile compressione pertritus. *Sepala* 3–5 mm. *Filamenta* 4–5 mm. *Antherae* 2.5–4.0 mm., *acumine* ca. 0.4 mm. *Carpella* stipitata gibbosa dorso basi concavo, parte apicali convexo. *Stylus* una cum stigmate 8–10 mm. *Carpella* matura ignota. Floret Aprili,

Majo, et verosimiliter Martio.—Peru: *Dombey* (Paris Museum, TYPE; F, ISOTYPE and a photograph of the type). LIMA: *Macbride & Featherstone 409*, Matucana, in shrubby thicket on western slope, 4 ft. high, bracts rose-green, anthers yellowish, alt. about 8000 ft., Apr. 12–May 2, 1922 (F, NY).

It is possible that the flowering material at hand might belong to some species already described from the fruiting stage, but the material is still too scanty to elucidate this point.

67. T. RUTIDOCARPUM DC. Syst. **1:** 172, 1817. *Planta* 8–13 dm., glabra, foliolis inferne exceptis. *Pubescentia* sparsa e pilis crassiusculis brevibus opacis. *Caulis* sulcatus facillime pertritus. *Flores* polygamo-monoici, plurimi perfecti, pauci masculi. *Sepala* 4–5 mm. longa. *Filamenta* ca. 6 mm. *Antherae* ca. 3 mm., *acumine* 0.3–0.4 mm. *Stylus* una cum stigmate 3.5–6.5 mm. *Carpella* matura 5.5–6.0 mm. longa, *stipite* ca. 2 mm., ventre subrhomboideo ca. 4 mm. longo, ca. 2.8 mm. lato, *nervis* lateralibus paucis ramosis et anastomosantibus, nervo dorsali ad basem et superne concavo ad medias paululum convexo, ventrali gibboso et convexo. Floret Januario et Februario.—Peru: *Dombey* (Paris Museum, TYPE; F, photograph and fragment of type). APURIMAC: *Stork & Horton 10,693*, prov. Andahuaylas, Pincos, rainy-green shrubland, humus over sand, annual herb 1.3 m., monoecious, general color of fl. variable green to purple, fr. an immature follicle, alt. 2700 m., Feb. 19, 1939 (F). HUANCAVELICA: *Stork & Horton 10,268*, prov. Tayacaja, Salcabamba, part shade, among shrubs, annual herb reaching 1 m., monoecious, stamens greenish yellow, conspicuous, follicles partly mature, alt. 3250 m., Jan. 7, 1939 (F). Fig. 67.

68. T. VESICULOSUM Lecoyer, Bull. Soc. Bot. Belg. **24:** 130, 1885. *Planta* omnino glabra saepius haud glauca, metralis vel sesquimetralis. *Radices* fibrosae. *Flores* polygamo-monoici, plurimi perfecti pauci masculi. *Sepala* 5.0–6.5 mm. longa, ovata. *Antherae* 3.0–3.5 mm., *acumine* ca. 0.5 mm. *Filamenta* ca. 7 mm. *Stylus* una cum stigmate 7–10 mm. *Ovarii* stipes 0.5–1.5 mm. *Carpella* matura 7.0–7.5 mm. longa, *stipite* 1.0–2.5 mm., ventre 4.5–5.3 mm. longo, ca. 3.3 mm. lato, *nervis* lateralibus ramosis anastomosantibusque, nervo dorsali ad basem concavo ad medias et superne parum convexo, ventrali convexiore quam dorsali et gibboso. Floret a mense Martii usque ad Julii. —Ecuador: *Spruce 5470*, in Andibus, 1857–1859 (NY, syntype); *Jameson* (US); *André 2100*, San Juan, Quindio, 8 martii, 1876 (F, NY); *Jameson 130*, Quitensian Andes at 11,000 feet of elevation, July, 1859 (NY). PICHINCHA: *Firmin 157*, Cerra del Cinto, Ugshu-Cinto, Camino, alt. 3250 m., Jul. 28, 1927 (US); *Jameson*, Pichincha, alt. 11,000 feet of elevation (NY); *Firmin 680*, borde del camino de La Magdalena al Cinto, pl. algo frecu-

ente en los matorrales, alt. 3100 m. [?], Oct. 25, 1928 (US). BOLIVAR: *Penland & Summers 589*, Hacienda Talahua, 1 m. tall, alt. 330 m., May 1, 1939 (F, US). AZUAY and CAÑAR: *Hitchcock 21,674*, between Cuenca and Huifgra, moist shady ravine, alt. 2700–3000 m., Sept. 11–13, 1903 (US); *Penland & Summers 1014*, Tipococha, up to 1½ meters, alt. 3200 m., July 11, 1939 (F, US). PERU, CUZCO: *Herrera 3070*, Apurimac Valley, "Pinco", 1931 (US). FIG. 68.

Other syntypes not seen are *Mandon*, Sorata; *Jameson 212; Hieronymus*, Sierra Chica, Rio primero; *Goudot*, Bogota; *Jameson*, Artisana. These syntypes might be heterogeneous for they include a far greater range than the one we have accepted. There seems, however, to be some material of this species from Bolivia amongst *Rusby 501–502*, but we do not dare try to disentangle that mixture.

69. T. **Nelsonii,** sp. nov. *Planta* elata omnino pubescens. *Pubescentia* e pilis capitatis translucidis nisi in foliolis inferne ubi pili capitati cum pilis brevibus opacis truncatis intermixti sunt. *Flores* polygamo-monoici, plurimi perfecti, pauci masculi. *Sepala* ca. 5 mm. longa. *Filamenta* ca. 8 mm. *Antherae* ca. 3 mm., *acumine* ca. 0.5 mm. *Stylus* una cum stigmate 6–7 mm. *Carpella* matura conspicue gibbosa, 7–8 mm. longa, *stipite* 1.5–2.0 mm., ventre ca. 6 mm. longo, ca. 3.5 mm. lato, *nervis* lateralibus gibbosis reticulatis, nervo dorsali ad basem concavo, ad medias et superne convexo, ventrali convexiore et gibboso. Floret a Junio usque ad Octobrem.—MEXICO, OAXACA: *Nelson 1788*, near Rayes, alt. 6700–10,000 ft., Oct. 20, 1894 (G, TYPE; US, ISOTYPE); *Conzatti & Gomez 2424*, dist. Cuycatlan, Cuyamecalco, alt. 1800 m., junio 23, 1909 (F, US). FIG. 69.

70. T. PODOCARPUM HBK. ex DC. Syst. **1:** 171, 1817. *Physocarpum podocarpum* (DC.) Bercht. & Presl, O Priroz. Rostl. **1:** 15, 1823. *T. cordifolium* Willd. ex Lec. Bull. Soc. Bot. Belg. **24:** 262, 1885, nomen nudum ut synonymon. *Planta* circa sesquimetralis omnino glabra. *Flores* polygamo-monoici, plurimi perfecti, pauci masculi. *Sepala* ovata 4–7 mm. longa. *Filamenta* 3–7 mm. *Antherae* 3.0–4.5 mm., *acumine* 0.3–1.0 mm. Ovarii *stipes* 0.5–1.5 mm. *Carpella* matura caesia valde compressa apice acuta 9.0–10.5 mm. longa, *stipite* 2.5–3.0 mm., ventre 6.0–6.5 mm. longo, 2.8–3.3 mm. lato, *nervis* lateralibus reticulatis nullo modo gibbosis, nervo dorsali ad basem concavo ad medias superneque vel fere recto vel parum convexo, ventrali convexo saepius gibboso. Floret Junio, Septembri, Decembri et aliis.—VENEZUELA: *Cardona 299*, Táchíra, Páramo de Tamá, alt. 3100–3300 m., July, 1939 (US); *Gehriger 180*, Mucurubá, quebrada vel pueblo, en las orillas y vegas de un riachuelo, cerca

de la casas, planta de 1.50 m., n. v. Colanillota, alt. 2500 m., junio 18, 1930 (ANS, F, M, NY, US); *Linden 362*, hautes Andes de Truxillo et de Merida, depuis 4000 jusqu'à 14,500 pieds de hauteur, 1842 (F). Colombia: *Bonpland* (Paris Museum, type; F, photograph and a few leaflets from the type); *Weddell 3808*, prov. Tomina, dépt. Chuquisaca, déc., 1845–janv., 1846 (F); *Triana*, Andes de Bogota, Quindio, vulgo "lutantillo" [?], alt. 2000–2700 m., 1851–1857 (NY); *Pennell 10,332*, dept. Caldas, Rio San Rafael below Cerro Tatama, clearing along stream, alt. 2400–2600 m., Sept. 7–11, 1922 (ANS, G, US); hb. *Parseval-Grandmaison*, Mt. Serrate près Bogota, 1861 (G); *Pennell 6898*, dept. of El Cauca, above Papayan, along stream, herb, flowers greenish-white, alt. 1750–1800 m., June 19, 1922 (ANS, G, US); *Killip & Smith 16,017*, dept. Santander, vicinity of Las Vegas, thicket, coarse herb, sepals green, anthers yellow, alt. 2600–3000 m., Dec. 21–23, 1926 (G, NY, US). Ecuador: *Jameson 202*, Quito (US). Fig. 70, a and b.

Subsectio **Venturiana,** subsect. nov. *Flores* perfecti (!). *Antherae* apice truncatae. *Ovaria* 18–36 in flore. *Stigma* paululum clavatum. *Carpella* matura globosa *nervis* sinuosis gibbosisque.

T. inuncans nostrum might, perhaps, just as well belong to this group, but until the fruits of that species are known, it is not possible to settle this question. Its ovary is perfectly smooth, a fact suggesting that the fruit may not be gibbose at all, but this relation does not always hold true.

71. T. **Venturii,** sp. nov. *Planta* omnino glabra, 5–9 decimetrorum. *Radices* fibrosae paucae, parum tuberosae. *Folia* estipellulata, 3–4-ternata *petiolulis* arcuantibus, *stipellis* reductis. *Foliolae* tenues. *Inflorescentia* foliosa, pauciflora, paniculata nec apice racemosa. *Flores* lutei perfecti (!), 6–12 in planta. *Sepala* ovalia, nec satis nota. *Stamina* 12–20 in flore. *Filamenta* capillacea subrigida, 5.5–7.0 mm. *Antherae* luteae, oblongo-lineares, apice squarrosae vel retusae, 2.0–2.5 mm. *Pistilla* numerosa 18–36 in flore, stipitata, inflata, *stigmate* 2.5–6.0 mm., parum clavato, apice obtuso, aliquandiu persistente. *Carpella* matura numerosa ventre globoso 2.0–2.5 mm., *nervis* gibbosis et sinuosis, nervo dorsali fere tam convexo quam ventrali. Floret Decembri.—Argentina, salta: *Venturi 10,026*, dept. Guachipas, Alemania, bajo bosque alto, flor amarilla, Dic. 15, 1929 (G, type; M, NY, US, isotypes). tucumán: *Venturi 7713*, dept. Burroyaco, Cerro del Campo, en el alisal, flor amarilla, Dec. 15, 1928 (F, G, US); *Venturi 3995*, (parte), dept. Chicligasta, Estancia Las Pavas, en los prados, flor amarilla, Dec. 11, 1925 (G). catamarca: *Jörgensen 1304* (pars), dept. Andalgala, El Candada (US). Fig. 71, a–c.

Sectio **Pelteria** sect. nov. *Planta* glabra, vel pubescens, nonnunquam glauca vel lucida vel scabra, *radicibus* fibrosis. *Folia* 1–6-ternata *foliolis* peltatis. *Flores* omnes perfecti vel polygamo-monoici, cum alii perfecti alii masculi sunt. *Pedunculi* sub fructu reflexi. *Filamenta* filiformia purpurascentia. *Sepala* ovata virescentia vel plus minusve purpurascentia. *Stigmata* filiformia, 1–10 in flore, decidua. *Carpella* matura compressa inaequilateralia, subsessilia vel stipitata. Species typica *Thalictrum peltatum* DC. sit.

This section is restricted to the mountaineous regions of Mexico and Central America. Other species with peltate leaflets also occur in Eastern Asia, but they belong to another subgenus.

In most sections of the genus, the vegetative characters are highly variable and furnish but few characters to distinguish species. Contrariwise, in this section a most satisfactory key can be drawn up entirely on vegetative characters. As for the flowers, they offer but few instances of good characters permitting separation of the species from one another. The fruits offer much better characters but they are deceptive in that the immature fruit may be larger, longer, more compressed, more recurved and less stipitate than the mature one.

Full many a species of this section has been described as polygamous or dioecious. With the help of a good binocular, thorough examination was undertaken of all the flowering material and it failed to reveal any pistillate or staminate plant. In many species all flowers are perfect, in others each plant bears both perfect and staminate flowers. Staminate flowers tend to bloom later than the perfect ones.

Subsectio **Subpeltata,** subsect. nov. *Planta* glabra vel pubescens vel scabra. *Folia* 3–6-ternata, petiolata. *Foliolae* prope marginem insertae 3–7-lobatae, vel grosse 3–7-dentatae. *Flores* omnes hermaphroditi, vel plurimi perfecti et pauci masculi in planta.

a. Pili omnes brevissimi capitati....*b.*
- *b.* Caulis glaber....72. *T. Lankesteri.*
- *b.* Caulis pubescens....73. *T. Torresii.*

a. Pauci pilorum aciculares semimillimetrales vel longiores 74. *T. guatemalense.*

72. T. Lankesteri Standley, Field Mus. Nat. Hist. Pub. Bot. **18:** 435, 1937. *Planta* glabra nisi per foliolas, verosimiliter metralis. *Pubescentia* e pilis capitatis vel crassiusculis brevissimis. *Radix* fibrosa. *Antherae* ca. 2.5 mm., *acumine* 0.5–1.0

mm. *Filamentum* ca. 3.5 mm. *Stylus* una cum stigmate 8–10 mm. *Carpella* matura compressa, glabra vel pubescentia, ca. 6 mm. longa, ventre 4.5–5.0 mm. longo, 2.2–2.5 mm. lato, *stipite* 0.5–1.0 mm., *nervis* lateralibus valde anastomosantibus nervo dorsali fere recto. Floret Junio.—Costa Rica: *Brenes 14,506*, près San Ramon, pentes rocheuses du cerro de San Isidro, alt. 1300 m., 14 junio, 1901 (G, US); *Solis 297*, Icsasu, cerro de Molti, alt. 1300 m., Aug., 1935 (F, M); *Tonduz 8951*, La Verbena, Aug., 1894 (US); *C. H. Lankester 337*, Concaves, rocky slopes, July, 1919 (F, type and isotype). Fig. 72, a–d.

73. T. **Torresii** Standley & Boivin, sp. nov. *Planta* metralis omnino pubescens, nisi in carpellis cum *pubescentia* est e pilis capitatis. *Folia* caulinaria sessilia in apice dilatationis petiolaris. *Sepala* elliptica 2.5–3.0 mm. longa. *Antherae* ca. 3.5 mm., *acumine* millimetrali. *Filamenta* ca. 5.5 mm. *Stylus* una cum stigmate 5.0–7.5 mm. *Carpella* matura compressa sessilia ca. 7.5 mm. longa, ca. 2.0 mm. lata, *nervis* fere simplicibus, nervo dorsali concavo.—Costa Rica: *Torres 187*, Santa Lucia, Paraiso, terreno pedregoso, altura planta 1 m., tiene en las hojas una sustancia pegajosa, 28 julio, 1927 (US, type); *Valerio 1652*, Tiquires, alt. 1700 m., July 1, 1937 (F). Fig. 73, a–d.

74. T. guatemalense C. DC. & Rose, Contrib. U. S. Nat. Herb. **5:** 88, 1899. *T. peltatum*, var. β *hirsutum* Loes., Bull. Herb. Boiss. 2° série, **3:** 89, 1903. *T. hondurense* Standley ex Yuncker, Field Mus. Nat. Hist., Bot. **17:** 362, 1938. *Planta* omnino pubescens, plus minusve scabra, 8–12–(20) dm. *Pubescentia* e pilis aliis capitatis crassiusculis truncatis aliis elongatis flexuosis. *Radix* fibrosa. *Folia* caulinaria saepius 4-ternata *petiolo* brevi, vel sessilia in apice dilatationis petiolaris. *Pedicelli* plus minusve recurvati. *Sepala* elliptica 3.0–3.5 mm. longa. *Antherae* 4–5 mm., *acumine* 0.5–1.0 mm. *Filamenta* 3.5–4.0 mm. *Stylus* una cum stigmate 6–9 mm. *Fructus* compressus 3.5–5.5 mm. longus, ventre 3.0–4.5 mm. longo, 1.5–2.0 mm. lato, *stipite* 0–0.5 mm., *nervis* parum ramosis reticulatisque, nervo dorsali fere recto vel concavo. Floret Junio vel Julio vel Augusto.—Mexico, mexico: *Hinton et al. 4263*, Temascaltepec, Tejupilco, llano, stalks 1 m., July 31, 1935 (M); *Hinton 4530*, Temascaltepec, Nanchititla, in the water, 2 m. high, Aug. 15, 1933 (G, NY, US); *Matuda 1739*, Cascada Siltepechis, Ago. 5, 1937 (F, G, M, NY). michoacan: *Arsène 5282*, vicinity of Morelia, Loma Santa Maria, alt. 1950 m., Sept. 4, 1910 (G, M, NY, US); *Arsène 2610*, près Morelia, Cuincho, alt. 1900 m., July 1, 1909 (G, M, NY, US); *Leavenworth & Hoogstraal 1232*, Tancitaro region, two miles south of Uruapan, rocky land, very hirsute almost prickly, very common, alt. 5577 ft., July 29, 1941 (F, M, NY). chiapas: *Matuda 4389*, near Siltepec, Honduras, in encinal, alt. 1500 m., July 9, 1941 (M); *Purpus 6798*, Cerro del

Boqueron, Sept., 1913 (UC); *E. W. Nelson 3236e*, near San Cristobal, alt. 7000–8000 ft., Sept. 18, 1895 (US). GUATEMALA: *S. Hayes*, Las Vacas barranca, June 1860 (G, US). HUEHUETENANGO: *C. & E. Seler 3153*, unter Gebüsch auf dem Coes von Zac-ulen bei Huehuetenango, 17 juni, 1896 (G, NY, US, isotypes of *T. peltatum* var. β *hirsutum*); *C. & E. Seler 2857*, Checulá, auf den mit Busch u. Wald bewachsenen Steinfalzungen alter Bauten, 28 aug., 1896 (G, NY, US); *Standley 81,212*, mountains west of Aguacatán on the road to Huehuetenango, oak forest, herb 1 m. tall, alt. about 1950 m., Dec. 27, 1940 (F); *Standley 81,566*, near Puente de Xinaxó, along road 13 km. west of Huehuetenango, pine-oak forest, herb 1 m. tall or less, common but out of flower, alt. about 1800 m., Dec. 30, 1940 (F); *Standley 81,973*, along Aguacatán road east of Huehuetenango at km. 13–14, damp forested quebrada, common, alt. about 1950 m., Jan. 2, 1941 (F); *Standley 83,010*, east of San Rafael Pitzal, near crossing of Rio San Juan Ixtán, open oak forest, herb 1 m. tall, common, alt. about 1730 m., Jan. 9, 1941 (F). BAJA VERAPAZ: *Cook & Doyle 254*, Santa Rosa, May 28, 1904 (US); *von Türckheim 1313*, Santa Rosa, im Walde, alt. 5000 p., Juli, 1887 (F, G, US); *von Türckheim 2307*, zwischen Santa Rosa und Patal, Wald, alt. 1600 m., Juli, 1908 (F, G, NY, US). ZAPACA: *Steyermark 29,676*, Sierra de las Minas, between Río Hondo and Finca Alejandria, moist forested slopes, alt. 1700–2000 m., Oct. 11, 1939 (F); *Steyermark 29,654*, along trail between Río Hondo and summit of mountain at Finca Alejandria, pine-covered slopes, rocky places, alt. 1000–1500 m., Oct. 11, 1939 (F). CHIMALTENANGO: *Standley 57,897*, along road from Chimaltenango to San Martín, wet thicket, common but past fruit, herb 3–4 ft., alt. 1500–1900 m., Nov. 25, 1938 (F); *Standley 57,927*, eodem, damp forest, herb 3 ft., alt. 1500–1900 m., Nov. 25, 1938 (F); *Standley 61,561*, southeast of Patzúm, barranco de La Sierra, pine and oak forest, herb 3–4 ft., common, alt. about 2100 m., Dec. 31, 1938 (F); *Standley 80,039*, southeast of Chimaltenango, along Río Guacalate, oak forest, common but past flowers, alt. about 1700 m., Dec. 14–23, 1940 (F). SACATEPEQUEZ: *Gomez 794*, Santiago, alt. 6500 p., 1891 (G, US, paratypes of *T. guatemalense*); *Standley 58,980*, cuesta de la Canas, above Antigua, damp thicket, herb 4 ft., alt. about 1950 m., Dec. 6, 1938 (F); *Standley 80,994*, along Río Guacalate, on road between Antegua and Chimaltenango, alt. about 1660 m., Dec. 23, 1940 (F). GUATEMALA: *Deam 6096*, on top of mountain, growing among rocks, June 1, 1909 (G, US); *Tonduz 657*, près de Guatémala, dans les broussailles des collines, juin 1921 (G, NY, US); *Aguilar 249*, 1939 (F). SANTA ROSA: *Heyde & Lux 3933*, Cenaguilla, alt. 4000 p., Sept., 1892 (G, M, NY, US). JALAPA: *Steyermark 32,541*, Cerro Alcoba, just east of Jalapa, oak woods, alt. 1300–1700 m., Dec. 2, 1939 (F);

Standley 76,810, 76,823, on hills northeast of Jalapa, rocky scrub-oak forest, herb 1 m. tall, alt. 1400–1600 m., Nov. 10, 1940 (F). Honduras, comayagua: *Yuncker, Dawson & House 5796*, near Siguatepeque, on rocky hillside, plants about 4 ft. tall, more or less viscid and with pungent odor, roots a rich yellow color, June to Aug., 1936 (F, type; G, M, NY, US, isotypes of *T. hondurense*). Fig. 74, a–d.

The type of *T. guatemalense* C. DC. & Rose (*Heyde 164*) was stored away and could not be seen.

Subsectio **Eupeltata** subsect. nov. *Planta* glabra vel pubescens e *pilis* multiseriatis translucidis, vel crassiusculis opacis truncatis, nonnunquam glauca vel valde lucida. *Foliolae* ampliores rotundae vel obovatae, *petiolis* circa tertias insertis. *Flores* polygamo-monoici, plurimi perfecti, pauci masculi, nisi *Thalictro Treleasii* nostro cujus omnes perfecti sunt. Species typica *Thalictrum peltatum* DC. sit.

Whether the leaves are dull, shining or glaucous can not be relied upon as a specific character in this section, if we judge by what occurs in *T. Pringlei* Wats. None of the other species has been collected at all stages throughout the year, but they are likely to follow a course of development parallel, if not similar, to that of *T. Pringlei*.

a. Planta glabra, etsi pubescens nullo modo scabra. . . .*b.*
b. Folia omnia petiolata, petiolo baso dilatato. . . .*c.*
c. Planta glabra. . . .*d.*
d. Foliolae membranaceae, per marginem fere totam crenatae, crenis ca. 20 in foliola. . . . . .75. *T. Treleasii.*
d. Foliolae coriaceae, ad apicem grosse dentatae vel crenatae, crenis dentibusve 0–10 in foliola. . . .*e.*
e. Planta fere metralis, antheris acumen subequantibus, stylo una cum stigmate 8–13 mm. . . . . .76. *T. peltatum.*
e. Planta 0.35–0.80 metri, antheris quater ad sexies longior quam acumine, stylo una cum stigmate 6–9 mm. . . . . .77. *T. Pringlei.*
c. Planta, nisi in foliorum facie superna, pubescens, foliolis per ambas paginas valde rugosis. 78. *T. Pringlei*, var. *reticulatum.*
b. Folia omnia, nisi inflorescentiae reducta, sessilia in apice dilatationis stipularis. . . .*f.*
f. Foliolae 9 in foliis singulis caulinaribus et in inflorescentiae nonnullis. . . . . .79. *T. Roseanum.*
f. Foliolae 11–12 in foliis singulis nisi in inflorescentiae reductis. . . .*g.*
g. Antherae 3.0–4.5 mm., carpella matura 8.5–10.0 mm. longa. . . . . .80. *T. Arsenii.*
g. Antherae 2.0–2.5 mm., carpella matura 5.5–7.5 mm. longa. . . . . .81. *T. jaliscanum.*
a. Planta scabra pubescens, nullo modo glauca. . . .*h.*
h. Foliolae per faciem supernam scabrae. . . . . .82. *T. cuernavacanum.*
h. Foliolae glabrae superne. .83. *T. cuernavacanum*, var. *supraglabrescens.*

75. T. **Treleasii,** sp. nov. *Planta* glabra circiter 6 dm. alta. *Folia* petiolata. *Foliolae* membranaceae per marginem fere totam crenatae, crenis 20 admodum. *Sepala* ca. 4 mm. *Stamina* 20–30 in floribus singulis. *Filamenta* 5–6 mm. *Antherae* 4.0–5.5 mm. *Acumen* antherae 0.5–0.7 mm. *Ovaria* 3–6 in flore. *Stylus* una cum stigmate 6–9 mm. *Fructum* auctor non cognoscit, consimilem *Thalictro Pringlei* tamen esse videtur. Floret Junio.—MEXICO, GUERRERO: *Langlassé 1061*, Sierra Madre, alt. 1000 m., juin 16, 1899 (G, TYPE; US, ISOTYPE). FIG. 75, a and b.

Dedicated to Prof. WILLIAM TRELEASE who in 1886 published a monographic paper on the genus as represented in America north of Mexico.

76. T. PELTATUM DC. Prod. **1:** 11, 1824, nec sensu J. N. Rose, Contrib. U. S. Nat. Herb. **5:** 186, 1899; nec *T. peltatum* Sessé & Moc., Fl. Mex. 134, 1894. *Planta* fere metralis, parum si vero glauca. *Foliolae* plus minusve coriaceae basi rotundae, ad apicem grosse dentatae vel crenatae, crenis vel dentibus 3–10 in foliola. *Sepala* 3.3–4.5 mm. longa. *Filamenta* 5–7 mm. *Antherae* 1.9–4.0 mm., acumina 2.0–6.5 mm. subaequantes. *Ovaria* 0–5 in flore, *stylo* una cum stigmate 8–13 mm. *Carpella* matura ignota, verosimiliter (ex immaturis) ca. 5.0 mm. longa, 2.0 mm. lata, semi-obovata, parum si vero stipitata, ista *Thalictri Pringlei* Wats. approximantia. Floret Augusto.—MEXICO, MEXICO: *Hinton 4547*, distr. of Temascaltepec, Nanchititla, oak woods, Aug. 18, 1933 (M, US); *Alaman*, [probably near Mexico city[1]], 1811 [or 1821?[1]] (TYPE in Delessert Herbarium; F, photograph of same). MICHOACAN: *Hinton 15,071*, distr. Barroloso, Coalcoman, woods, alt. 1300 m., Aug. 7, 1939 (G). FIG. 76, a–c.

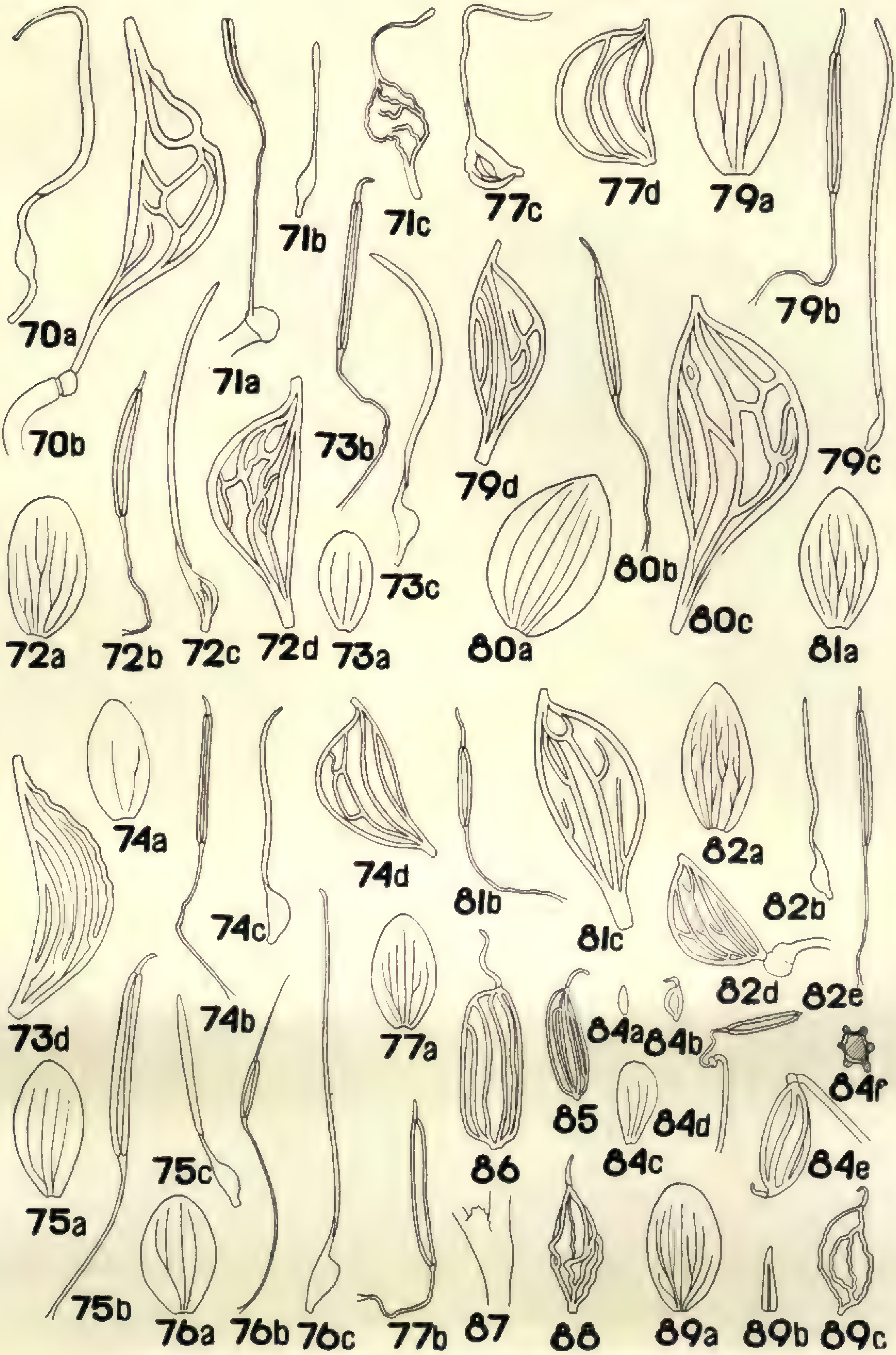
DeCandolle's original description applies well to all species of subsect. *Eupeltata*. In 1899, J. N. Rose (Contrib. U. S. Nat. Herb. **5:** 186) with the help of C. De Candolle solved the problem by comparing specimens from five different species with the actual type. Since *T. peltatum* DC. had been collected but once until as late as 1933, it is not surprising that the name was applied to its closest related species, for which we are now proposing the name *T. Roseanum*. But as we now have a very good photograph at hand it becomes possible even to take measurements of the actual type, e. g.: sepal 3.3 mm., acumen 2.3 mm., anther 1.9 mm., filament 5.1 mm., stigma 10.5–13.0 mm., fruit 5.0 x 2.1 mm., etc.

[1] Notes of the author.

77. T. Pringlei Wats. Proc. Am. Acad. **25:** 141, 1890. *Planta* glabra, saepius sub florendi tempus caeca, deinde saepius glauca cum fructus maturant, sub maturandi saepius lucida, posteaque lamina lucida exfoliatur, et planta pallida caeca revelatur. *Radix* fibrosa. *Folia* petiolata 2–4-ternata. *Foliolae* margine vel integra vel sinuata vel crenata vel grosse dentata, dentibus vel crenis 0–7 in foliola. *Sepala* 3.0–4.5 mm. longa. *Stamina* 30–50 in flore. *Filamenta* 3.0–3.5 mm. *Antherae* 3–4 mm., *acumine* 0.5–0.8 mm. *Stylus* una cum stigmate 6–9 mm. *Carpella* matura subsessilia semi-ovata, *nervis* simplicibus vel ramosis et anastomosantibus, nervo dorsali fere recto vel parum concavo. Floret Junio Julioque.—Mexico, nayarit: *M. E. Jones 22,843*, Tepic, Feb. 15, 1927 (F). mexico: *M. E. Jones 85*, La Palma. June 9, 1892 (UC, US); *Sarton*, Tolucca Mts., 1852 (US). michoacan: *Leavenworth & Hoogstraal 1823,* Tancitaro region, Apatzingan, common in open pine forest above Acahuato, sometimes in pure stands, alt. 3500–4000 ft., Aug. 23, 1941 (F); *Leavenworth 395*, Tancitaro on the road from Tancitaro to Apatzingan, here 2′–4′, common on rocky banks in pine woods from 4000–6000 ft., alt. 5000 ft., July 30, 1940 (F, M, NY); *Leavenworth & Hoogstraal 989*, Tancitaro, west of Santa Clara, gravelly bank near stream, open pine forest, alt. 6000 ft., July 11, 1941 (F, M). jalisco: *Pringle 2478*, slopes of the barranca near Guadalajara, June 29, 1889 (G, type; ANS, F, M, NY, UC, US, isotypes); *Pringle 2479*, hillsides near Guadalajara, slopes of the barranca of Guadalajara, alt. 5000 ft., July 16, 1902 (F, G, M, NY, US); *Rose & Hough 4824*, Guadalajara, in Barranca, July 9, 1899 (US); *Reke 4581*, Guadalajara, Barranca Ibarra, alt. 1400 m., Nov., 1922 (US); *Mexia 1412a*, Sierra Madre Mtns., San Sebastian, trail to Mascota, damp ravine in open pine forest, prominent on forest floor, alt. 1425 m., Jan. 7, 1927 (F, G, M, NY, UC). Fig. 77, a–d.

78. T. Pringlei Wats., var. reticulatum Rose, Contrib. U. S. Nat. Herb. **5:** 188, 1899. *Planta* 35–40 cm., pubescens nisi in pagina superna *foliolarum*. *Foliolae* vel crenatae, vel repandae, vel integrae, per ambas paginas rugosae *nervis* conspicue reticulatis.—Mexico, nayarit: *Rose 1985*, Territorio de Tepic, between Pedro Paulo and San Blascito, Aug. 6, 1897 (US, type; G, isotype); *Rose 1985a*, Territorio de Tepic, foothills between Pedro Paulo & San Blascito, Aug. 4, 1897 (US); *Rose 3372*, Territorio de Tepic, between Dolores & Santa Gertrudis, Aug. 7, 1897 (US).

The type of this variety was stored away and hence it has not been seen. With better flowering material and fully mature fruits, this variety might prove specifically different from the typical form.



Details of Flowers or Fruits of Thalictrum, all × 4.

(For explanation see end of paper.)

79. T. **Roseanum,** sp. nov. *T. peltatum* Sessé & Moc. Fl. Mex., **2:** 134, 1894 nec *T. peltatum* DC. Prod. **1:** 11, 1824. *Planta* glabra, saepius conspicue glauca, metralis vel altior. *Folia* biternata, sessilia in apice dilatationis stipularis. *Foliolae* majores orbiculares, ad apicem crenatae vel grosse dentatae. *Sepala* 5.0–5.5 mm. longa. *Antherae* 2.2–3.2 mm., *acumine* 1.0–1.5 mm. *Filamenta* 4–5 mm. *Stylus* una cum stigmate 6.5–9.0 mm. *Carpella* matura compressa 5.6–6.5 mm. longa, *stipite* 0.5–1.5 mm., ventro 4.2–4.5 mm. longo, 2.2–2.6 mm. lato, *nervis* nonnunquam parum ramosis anastomosantibusque, nervo dorsali convexo, ventrali convexiore quam dorsali. Floret Julio mense. An etiam Junioque?—MEXICO, MORELOS: *Pringle 7448,* bluffs of barranca above Cuernavaca, alt. 6500 ft., Aug. 23, 1897 (G, TYPE; M, US, ISOTYPES); *Pringle 8261,* bluffs of mountain canyon above Cuernavaca, alt. 6500 ft., Sept. 30, 1899 (ANS, F, G, M, NY, UC, US); *Pringle 7205,* bluffs of barranca near Cuernavaca, alt. 6000 ft., Jul. 28, 1896 (G, US). FIG. 79, a–d.

Dedicated to the late JOSEPH NELSON ROSE who laid the foundations for our understanding of the Mexican species of *Thalictrum.*

T. peltatum Sessé & Moc. is a heterogeneous species as can be easily seen by what is preserved of it at the Field Museum. However the description seems mainly based on *T. Roseanum.* The fragments can not be identified with certainty.

80. T. **Arsenii,** sp. nov. *Planta* glabra saepius valde glaucescens. *Folia* 2–4-ternata, sessilia in apice dilatationis stipularis. *Foliolae* ovatae majusculae nonnunquam ad decimetrum diametro attingentes, saepius tamen circiter semidecimetrales, ad apicem grosse dentatae vel crenatae. *Sepala* 4.5–5.0 mm. longa. *Stamina* 25–30 in flore. *Antherae* 3.0–4.5 mm., *acumine* 1.2–2.0 mm. *Filamenta* 5–6 mm. *Stylus* una cum stigmate ca. 7.5 mm. *Carpella* matura compressa, ad *stipitis* apicem parum recurvata, 8.5–10.0 mm. longa, ventro 5.0–6.5 mm. longo, ca. 3.5 mm. lato, *nervis* aliquando simplicibus, saepius tamen ramosis anastomosantibusque, nervo dorsali convexo, ventrali convexiore quam dorsali. Floret sub menses Julii et Augusti.—MEXICO, MICHOACAN: *Arsène,* vicinity of Morelia, Jaripeio, alt. 2100 m., Jul. 13, 1911 (M, US); *Arsène,* près Morelia, Coronilla, 19 sept., 1909 (NY); *Arsène 2490,* vicinity of Morelia, Coronilla, en face de la prise d'eau, alt. 2000 m., 19 sept., 1909 (US); *Arsène 5470,* vicinity of Morelia, Rincòn, alt. 2000 m., 14 août, 1910 (G, TYPE; M, NY, US, ISOTYPES); *Kenoyer A-482,* Morelia, Aug. 17, 1938 (M); idem, Aug. 18 (F); *Arsène 8,* Morelia, talus, 8 juin, 1910 (CA); *Arsène 13,* Morelia, Rincòn, alt. 2000 m., 14 août, 1909 (F). FIG. 80, a–c.

Dedicated to Brother G. Arsène, an enthusiastic field-botanist. His Mexican collections are both abundant and well preserved and form a high percentage of the herbarium material at hand for study.

81. T. jaliscanum Rose, Contrib. U. S. Nat. Herb. **5:** 187, 1899. *Planta* glabra saepius valde glaucescentia, sesquimetralis usque bimetralis. *Folia* 2–6-ternata. *Fiololae* orbiculares vel obovales, ad apicem crenatae vel grosse dentatae. *Sepala* 3.0–3.5 mm. longa. *Stamina* ca. 30 in flore. *Antherae* 2.2–2.5 mm., *acumine* 1.2–1.7 mm. *Carpella* matura compressa, 5.5–7.5 mm. longa, ventre 5.0–5.5 mm. longo, 2.0–2.5 mm. lato, *stipite* 0–1.5 mm. longo, *nervis* ramosis anastomosantibusque, nervo dorsali convexo, ventrali convexiore quam dorsali.—Mexico, mexico: *Hinton 4259*, Temascaltepec, Telpintla, alt. 1840 m., July 28, 1933 (G, NY); *Hinton et al. 6557*, Temascaltepec, Rincon del Carmen, edge of oak woods, 1.5 m. high, Sept. 6, 1934 (G, NY, US); *Hinton 1078*, Temascaltepec, Volcan, rolling prairie, 2 m. high, alt. 1410 m., July 18, 1932 (F); *Hinton 6740*, Temascaltepec, Platanal, hill, 1.5 m. high, Oct. 11, 1934 (NY). jalisco: *Rose & Hough 4785*, near Tequila, July 5 and 6, 1899 (US); *Goldsmith 28*, east of Volcano Colima, wooded hills, alt. 5000 ft., July 13, 1905 (G); *Rose & Painter 7519*, near Etzatlan, Oct. 2, 1903 (NY, US); *Rose & Painter 7643*, near Chapala, Oct. 5, 1903 (US); *Diquet* (NY): *Mr. & Mrs. J. G. Lemmon 157*, lake Chapala, 1905 (F, G, UC). Fig. 81, a–c.

The type (*Rose 2840*) has not been seen but the original description is clear enough. One label states that the plant is 3.4 m. high. Such a height is not impossible, but the way the number presents itself suggests the possibility of an error.

82. T. cuernavacanum Rose, Contrib. U. S. Nat. Herb. **5:** 187, 1899. *Planta* omnino scabra, 7–12 decimetrorum, nullo modo glauca. *Folia* 2–3-ternata, petiolata, dilatatione petiolari reducta. *Foliolae* orbiculares, per marginem fere totam crenatae. *Stamina* ca. 30 in flore. *Antherae* 2.5–5.0 mm., *acumine* 0.7–1.2 mm. *Filamenta* 4.0–5.5 mm. *Stylus* una cum stigmate 4–9 mm. *Carpella* matura compressa 3–5 mm. longa, 1.5–2.8 mm. lata, *stipite* 0–0.5 mm., *nervis* simplicibus vel parum ramosis anastomosantibusque, nervo dorsali recto vel paululum convexo. Floret Junio et Julio.—Mexico, morelos: *Rose 6860*, near Cuernavaca, Sept. 8, 1903 (NY, US); *Pringle 7238*, near Cuernavaca, rocky bluffs of barranca, alt. 5000 ft., July 26, 1896 (US, type; F, G, M, isotypes); *Pringle 6878*, above Cuernavaca, lava fields, alt. 7000 ft., June 27, 1898 (ANS, F, G, M, NY, UC, US, paratypes). Fig. 82, a–d.

Type not seen, but there is an abundance of isotypes and paratypes at hand.

83. T. cuernavacanum Rose, var. **supraglabrescens,** var. nov., Morton in litt. *Foliolis* supra glabris nec scabris.—Mexico, guerrero: *Rusby 153,* Limon Mtn., alt. 4000 ft., July 28, 1910 (US, type and isotype; NY, isotypes); *Lyonnet 304,* Taxco, julio, 1929 (US); *Kenoyer A-481,* Taxco, July 20, 1938 (F).

Sectio **Heterogamia,** sect. nov. Sect. *Thalictrum,* 1. *Heterogama* DC., Syst., **1:** 172, 1817. *Plantae* glabrae vel pubescentes. Pubescentia, cum adest, pilorum capitatorum translucidorum. *Flores* dioici. *Sepala* dimorpha, floris masculi majora saepius colorata, foeminei minora viridia vel raro purpurascentia. *Filamenta* imprimis lutea deinde nonnunquam purpurascentia, nec clavata sed filiformia et sub antheris paullulum dilatata. *Stigma* plus minusve bialatum. Species typica *Thalictrum dioicum* L. sit.

Group confined to Mexico, United States, Canada and the French Islands of St.-Pierre et Miquelon.

Subsectio **Debilia,** subsect. nov. *Plantae* glabrae, *foliis* ternatisectis, *radicibus* tuberosis fusiformibus haud stoloniferae. *Caulis* basis decumbens. *Folia* inferiora desunt nisi reducta velis vaginis, intermedia plurima conferta, superiora pauca sparsa, inflorescentiae minora. *Stipellulae* desunt. *Inflorescentia* elongata pauciflora paniculata. *Carpella* matura subsessilia recta haud compressa, ventre symetrico pariete membranaceo, *nervis* simplicibus convexis nec sinuosis. Species typica *Thalictrum debile* Buckley sit.

a. Carpella matura ovoidea; stigma 0.5–1.0 mm. Planta rigida radicibus nigris . . . . 84. *T. texanum.*
a. Stigma 1.3–3.0 mm. Plantae decumbentes radicibus brunneis . . . . *b.*
  b. Carpella matura elliptico-lanceolata, 0.7–1.2 mm. lata . . . . 85. *T. debile.*
  b. Carpella matura ellipsoidea, 1.5–2.0 mm. lata . . . . . 86. *T. arkansanum.*

84. T. texanum (Gray) Small, Fl. Se. U. S. 446, 1903. *T. debile* Buckley, var. *texanum* Gray ex E. Hall, Pl. Tex. 3, 1873, nomen nudum; Gray, Syn. Fl. N. Am. **1:** 18, 1895. *Planta* rigida 10–45 cm. *Radices* nigricantes, cum siccatae, haud costatae sed irregulares. *Sepala* floris maris 1.7–3.0 mm., foeminei 0.7–1.5 mm. longa. *Filamenta* ca. 1.5 mm. *Antherae* 1.4–2.0 mm. *Stigma* 0.5–1.0 mm. *Carpella* matura ovoidea, stipite 0.1–0.3 mm., ventre 2.7–3.7 mm. longo, 1.4–1.6 mm. lato, apice acuto, basi rotundo, *nervis* 6–8 in fructu. Verosimiliter floret Februario et Martio.—Texas: *Wright 170,* Fayette Co., Cumming's Creek, May 10, 1849 (ANS, G); *Hall,* Houston, April, 1872 (F, paratype); *Hall 3,* Houston, moist prairies,

March 28, 1872 (G, TYPE; ANS, F, M, NY, US, ISOTYPES). FIG. 84, a–f.

85. T. DEBILE Buckley, Amer. Journ. Sci. **45:** 175, 1843. *Planta* innitens, 10–40 cm. *Radices* brunneae, cum siccatae, costatae. *Sepala* floris maris obovata, ca. 1.7–2.0 mm., foeminei saepius lanceolata, ca. 1.0 mm. *Filamenta* ca. 2.0 mm. *Antherae* 1.7–2.0 mm., *acumine* 0.1–0.3 mm. *Stigmata* 1.3–2.0 mm. *Carpella* matura oblongo-lanceolata, *stipite* ca. 0.1 mm., ventre per ambas apices rotundo 3.0–3.7 mm. longo, 0.7–1.2 mm. lato, *nervis* 8–10 in fructu. Floret Aprili.—GEORGIA: *Chapman*, Rome, 1882 (F, G, US); *Chapman*, Mts. of Georgia (M, US). ALABAMA: *Nieuwland*, Blount Co., Warnock Peak, April 12, 1930 (N-ND); *Buckley*, Wilcox Co., woods, rich alluvial soil, procumbent, April, 1840 (NY, US, paratypes); *Buckley* (ANS, G, paratypes); *Buckley*, April (M, paratype); *Buckley*, Wilcox Co., near Allenton, rich woods, April, 1842 (M, TYPE); *Buckley*, April, 1841 (M, NY, paratypes). FIG. 85.

86. T. **arkansanum,** sp. nov. *Planta* erecta 20–40 cm. *Radices* brunneae nonnunquam, cum siccatae, costatae. *Sepala* floris maris ovata vel elliptica 2.0–3.0 mm. longa, foeminei ovata 1.0–1.5 mm. longa. *Filamenta* 2.0–3.0 mm. *Antherae* 1.8–2.3 mm., acumine 0.1–0.4 mm. *Stigma* (1.5)–2.3–3.0 mm. *Carpella* matura sessilia ventro ellipsoideo 3.5–4.5 mm. longo, 1.5–2.0 mm. lato, *nervis* 10–12 in fructu. Floret Aprili et Majo.—ARKANSAS: *Canby, Sargent, Trelease & Bush*, Fulton, rich woods, Apr. 18, 1901 (ANS); *Bush 2445*, Fulton, low ground, Apr. 26, 1905 (M, TYPE); *E. J. Palmer 9403*, Hempstead Co., Fulton, upland open woods, Apr. 8, 1916 (ANS, US); *E. J. Palmer 7151*, Fulton, upland woods, Apr. 5, 1915 (NY, US); *J. C. Kellogg*, Arkansas Post, March 14, 1909 (M); *Bush 511*, Fulton, common in low ground, Apr. 4, 1900 (G, M, US); *Nuttall* (ANS); *Bush 2271*, Texarkana, low rich woods, Apr. 8, 1905 (M). FIG. 86.

Subsectio **Sinuosa,** subsect. nov. *Plantae* glabrae, raro paululum pubescentes pilis capitatis. *Radices* tuberosae. *Folia* sparsa foliolis parvis. *Stigma* sagittatum. *Carpella* matura recta basi rotunda, apice acuta, *nervis* simplicibus sinuosissimis et crassiusculis, nec costata. Species typica *Thalictrum pinnatum* Wats. sit.

a. Folia ternata vel raro subpinnata....*b*.
  b. Caulis basis procumbens aphyllus, folia ternata........87. *T. pudicum*.
  b. Caulis rigidus erectus, folia 2–3-ternata vel subpinnata, licet folia ramorum ternata....*c*.
    c. Caulis a basi ramosus, ramis foliosioribus, foliis 2-ternatis 88. *T. madrense*.
    c. Caulis foliis caulinariis 3-ternatis vel subpinnatis, ramorum plurimis vel omnibus aphyllis 90. *T. pinnatum*, var. *subternatum*.
a. Folia pinnata, pinnis ternatis......................89. *T. pinnatum*.

87. T. **pudicum** Standley & Boivin, sp. nov. *Planta* glabra, 5–25 cm., ramosa, *ramis* foliosis. *Caulis* gracilis erectus nisi basis procumbens. *Folia* ternata et fere omnia sessilia. Inferiora desunt vel *stipulae* istorum adsunt, quae stipulae oppositae lanceolatae et 2–4 mm. longae sunt. *Stipulae* foliorum fere omnes auriculatae et erosae. *Pedunculi* 2.5–5.0 cm. Flores singulae in ramis singulis. *Sepala* floris maris viridia ovata ca. 3.5 mm. longa. *Filamenta* ca. 5 mm. *Antherae* ca. 3.5 mm., *acumine* ca. 0.5 mm. Planta foeminea ignota. Floret Julio.—Mexico, michoacan: *Leavenworth, & Hoogstraal 1013,* 2 mi. so. of Tancitaro, edge of pedregal, along edge of canyon in moist soil, open situation, less than 1 ft. high, alt. 6000 ft., July 19, 1941 (F, type; M, isotype). Fig. 87.

88. T. madrense Rose, Contrib. U. S. Nat. Herb. **5:** 188, 1899. *Planta* glabra ramosa rigida 20–30 cm., *ramis* foliosis. *Ovaria* tamen interdum puberula, pilis capitatis translucidis minutissimis. *Folia* ramorum 1–2-ternata cetera 2-(3)-ternata. *Stipulae* integrae. *Pedunculi* 1.5–3.0 cm. *Flores* in paniculis angustis caulem et ramos definientes. *Sepala* foeminei lanceolata 1–2 mm. longa. *Stigma* 1.0–1.5 mm. *Carpella* matura ventre 3–4 mm. longo et 1.5–1.8 mm. lato. Planta mascula et tempus florendi ignota.—Mexico, durango: *Rose 3505,* Sierra Madre, alt. 5200 ft., Aug. 15, 1897 (US, paratype). nayarit: *Rose 2232,* Territorio de Tepic, in the Sierra Madre, near Santa Teresa, Aug. 13, 1897 (US, type; G, isotype). Fig. 88.

Type not seen.

89. T. pinnatum Watson, Proc. Am. Acad. **23:** 267, 1888. *Planta* erecta rigida glabra, 2–8 dm. alta. *Radices* tuberosae. *Folia* caulinaria pinnata, pinnis ternatis vel simplicibus raro pinnatis. *Stipulae* integrae. *Foliolae* parvae, basae cuneatae, apicales saepius trifidae. *Sepala* floris maris elliptica, 3.5–6.0 mm. longa, foeminei lanceolata vel linearia 1–2 mm. longa. *Filamenta* 3–4 mm. *Antherae* 2.5–4.5 mm., *acumine* 0.3–0.7 mm. *Stigma* 0.6–1.5 mm. *Carpella* matura 3.5–5.0 mm. longa, *stipite* 0.2–0.4 mm., ventre 2.5–3.0 mm. longo et 1.5–1.7 mm. lato, *nervo* dorsali irregulariter convexo, ventrali convexiore. Floret Junio Julioque.—Mexico, chihuahua: *LeSueur 1059,* Culebra Mts., Aug. 18, 1936 (F, G); *S. S. White 2255,* 4 miles northwest Chihuahua, Majalca (Pilares), alt. 6800 ft., Aug. 11, 1939 (G); *M. E. Jones,* Sierra Madre Mts., Soldier Canyon, alt. 6600 ft., Sept. 16, 1903 (CA, UC); *Townsend & Barber 134,* in the Sierra Madres, near Colonia Garcia, alt. 7500 ft., July 15, 1899 (F, G, M, NY, UC, US); idem *110,* July 6 (F, M, NY, US); *Shreve 9050,* summit of Santa Clara Mts., in pine forest, alt. 7100 ft., Aug. 13, 1939 (G); *Pringle 1563,* Sierra Madre, alt. 7000–8000 ft., Oct., 1888 (UC); *Pringle 1887,* base of the Sierra

Madre, pine plains, Sept. 20, 1887 (G, TYPE; ANS, F, NY, US, ISOTYPES); *Nelson 6037*, in the Sierra Madre, June–July, 1899 (NY, US); *Shreve 7997*, 6 mi. w. of C. Guerrero, in open oak and pine forest, alt. 7100 ft., July 25, 1937 (F); *Knobloch 5256*, San Juanito, July 20, 1938 (F); *Hartman 772*, near canyon de St. Diego, moist places on high mountains, "Culantrio", Sept. 17, 1891 (G, US). SONORA: *Pennell 19,611*, Cerro Saguarivo, east of San Bernardo, on rocks, alt. 1500–1600 m., Aug. 7–8, 1935 (ANS); *Schott 3*, Sierra del Najarito, June 28, 1855 (F). DURANGO: *E. Palmer 381*, Otinapa, July 25–Aug. 5, 1906 (F, G, M, NY, UC, US); *Garcia 341* (US); *Nelson 4541*, near El Salto, alt. 8000–8700 ft., July 12, 1898 (US); *Pennell 18,324*, El Salto, dry open pineland, herb, alt. 2570–2600 m., Aug. 28, 1934 (ANS). FIG. 89, a–c.

90. T. PINNATUM Wats., var. **subternatum** var. nov. A varietate typica differt *foliis* caulinariis subternatis vel etiam ternatis foliolisque membranaceis. *Planta* humilior est, 1–4 dm. alta, et crescit in locis humidosioribus. Floret Julii mense.—MEXICO, CHIHUAHUA: *Gentry 1526*, Sierra Charuco, Rio Fuerte, transition, herb scattered along rocks in spring in meadow, July 25, 1935 (F, TYPE; ANS, G, M, UC, US, ISOTYPES); *LeSueur 1211*, Chuichupa, Aug., 1936 (G). DURANGO: *Pennell 18,378*, El Salto, edge of marsh, herb, alt. 2530–2540 m., Aug. 28, 1934 (ANS).

Subsectio **Dioica** (Prantl), stat. nov. Sect. *Camptogastrum*, E. *Dioica* Prantl, Nat. Pfl. **3,** 2: 66, 1888. *Plantae* glabrae. *Radices* fibrosae. *Caulis* erectus rigidus. *Stipulae* integrae. *Stipellulae* desunt. *Petioli* articulati in insertione. *Carpella* matura sessilia inflata, ventre symmetrico nec compresso, pariete firmo, *nervis* simplicibus et directis. Species typica: *Thalictrum dioicum* L. ut patet e Prantl.

This group is made up of only one very distinct and little variable species.

91. T. DIOICUM L., Sp. Pl. **1:** 545, 1753. *T. laevigatum* Michx. Fl. Bor.-Am. **1:** 322, 1803. *T. pauciflorum* Rafinesque, Atl. Journ. **1:** 151, 1832, nec *T. pauciflorum* Royle, Ill. Bot. Him. 52, 1839, nec *T. pauciflorum* Schur, Verh. Sieb. Ver. Nat. **3:** 84, 1852, nec *T. pauciflorum* Steph. ex Lec., Bull. Soc. Bot. Belg. **24:** 302, 1885. *T. dioicum* L., var. *genuinum* Lec., Bull. Soc. Bot. Belg. **24:** 142, 1885. *T. pulchellum* Pursh ex Lec., Bull. Soc. Bot. Belg. **24:** 307, 1885, nomen nudum. *T. dioicum* L., var. *adiantinum* Greene, Ott. Nat. **23:** 39, 1909. *T. dioicum* L., var. *huronense* Greene, l. c. 1909. *T. dioicum*, L. var. *Langfordii* Greene, l. c. 40, 1909. *Leucocoma dioica* (L.) Nieuwland, Amer. Midl. Nat. **3:** 324, 1914.—*Planta* omnino glabra erecta rigida, 3–8 dm. *Radices* fibrosae. *Folia* supraternatisecta, basilaria

0–3 in planta, caulinaria 0–1, inflorescentiae plurima. Folium inferius inflorescentiae petiolo 3–8 cm. *Sepala* floris maris ovata vel elliptica 2.5–4.0 mm. longa, foeminei ovata vel obovata 1.8–2.2 mm. longa. *Filamenta* lutea 3.5–5.5 mm. *Antherae* luteae oblongo-lanceolatae vel lineares 1.4–4.0 mm. longae, *acumine* 0–0.2 mm. *Stigma* 1.0–2.5 mm. *Carpella* matura 4–5 mm. longa, *stipite* 0.3–0.4 mm., ventre ovoideo vel ellipsoideo 3.4–4.3 mm. longo, 1.5–1.8 mm. lato. *Nervi* carpellorum maturorum parum a costis distincti, pariter arcuantes vel interdum nervus ventralis quam dorsali convexior. Floret Aprili, Majo, Junio, Julioque.—"CANADA": *Kalm* (Linnean Society Lond., TYPE of *T. dioicum;* G, photograph). UNITED STATES (without localization): *Michaux*, in Pensylvania et montibus Carolinae (Paris, National Museum, type of *T. laevigatum;* G, photograph). SAINT-PIERRE ET MIQUELON: *L. Arsène 238*, Saint-Pierre, marécages de la ferme Maillard, lieux herbeux et humides, 8 juillet, 1902 (NY); *L. Arsène 263*, Saint-Pierre, anse à Ravenel, lieux herbeux et humides, bois, 8 et 20 juillet, 1900 (G). QUÉBEC: *Peers*, Montreal, Mt. Royal, May 11, 1941 (CA); *C. H. Knowlton*, Missisquoi, Philipsburg, dry calcareous woods, Aug. 10–11, 1923 (G); *Macoun & Malte 88,011*, Hull, north end of Fairy Lake, May 9, 1913 (C). MAINE: *Fernald*, Penobscot Co., Orono, rocky woods, May 19, 1890 (NE); *C. A. E. Long 858*, Knox Co., Rockland, rocky bank, May 2, 1921 (NE); *Fernald 13,636*, Kennebec Co., Vassalboro, brooksides and gullies in clay terraces, July 6, 1916 (NE); *Furbish*, Cumberland Co., Brunswick, 1880 (NE). NEW HAMPSHIRE: *Beetle 331*, Grafton Co., Hanover, May 16, 1936 (NE); *Rand & Robinson 458*, Cheshire Co., Troy, Gap Mt., rocky woods, June 13, 1898 (G, NE). VERMONT: *C. H. Knowlton*, Orange Co., Newbury, slaty woods, May 17, 1932 (NE); *E. E. Phelps*, Windsor Co., Windsor (NE); *E. F. Williams*, Rutland Co., Brandon, May 21, 1908 (G, NE); *Fernald, Harris, Drew et al.*, Bennington Co., Manchester, Mount Equinox, rich woods, May 21, 1932 (NE). MASSACHUSETTS: *Morong*, Hamilton, damp places among rocks, May & June 1875 (F, paratype of *T. dioicum* var. *Langfordii*); *A. W. Cheever*, Plymouth Co., Hingham, June 22, 1924 (NE); *Bean & Schweinfurth 16,071*, Worcester Co., Charlton, woods, May 20, 1916 (NE); *C. H. Knowlton*, Franklin Co., Greenfield, moist alluvial terrace, May 12, 1912 (NE); *Forbes & Wheeler*, Hampshire Co., Mt. Tom, ledges near base, Holyoke diabase, May 17, 1903 (NE); *St. John & White 168*, Hampden Co., Russell, sandy bank, sericite schist (Savoy Schist), May 17, 1913 (NE); *Knowlton & Schweinfurth*, Berkshire Co., Mount Washington, dry open woods, May 30, 1919 (NE); *G. Gilbert*, Newton, Pine Grove, May 6, 1894 (G). RHODE ISLAND: *Leland*, Johnston Co., Snake Den, May 13, 1899 (NE);

M. B. Simmons, Newport Co., Middletown (NE). CONNECTICUT: *Woodward*, New London Co., Rachel's Hut, rocky woods, May 27, 1905 (NE); *P. Spalding*, Hartford Co., East Granby, May, 1920 (NE); *Safford*, New Haven Co., New Haven, East Rock, June 2, 1884 (US). NEW YORK: *O. P. Phelps 460 & 461*, Canton, woods, May 19, 1914 (G); *Burnham*, Washington Co., ½ mile east of Tripoli schoolhouse, rocky copse, May 13, 1914 (G); *McVaugh 4107*, Columbia Co., Ghent, moist rocky banks, May 1, 1936 (G); *Raup 8105*, Orange Co., Black Rock Forest, ravine of Canterbury Brook, May 18, 1937 (G); *Eames & Metcalf 2301*, Tompkins Co., Ithaca, gravelly soil, side of gully, May 7, 1904 (G); *E. B. Bartram*, Monroe Co., Rochester, moist woods, May 15, 1910 (G); *Peck*, St. Lawrence Co., Rossie, June 10, 1909 (US). NEW JERSEY: *Carey*, Bergen, ravine, May 24, 1842 (G); *Fogg 12,313*, Somerset Co., Sourland Mts., about 4 m. n. w. of Blawenburg, July 7, 1937 (G); *B. Long 39,983*, Hunterdon Co., Treasure Island, steep wooded bank along Delaware River, May 21, 1933 (G). PENNSYLVANIA: *Fogg 6502*, Delaware Co., n. of Swarthmore, wooded hillslope along creek, May 17, 1934 (G); *Heller*, Lancaster Co., on the Conestoga near Binkley's Bridge, in limestone, May 4, 1901 (G); *Galen 24*, Lancaster Co., April–May, 1885 (G); *Wahl 643*, Elk Co., 3 mi. W. of Caledonia, gravelly roadside, June 2, 1940 (G); *Fender 1500*, Union Co., 2 m. se. of Lewisburg, along West Branch of Susquehanna River, June 15, 1936 (G); *E. B. Bartram*, Chester Co., Frazer, April 23 & 30, 1910 (G); *Fogg 14,473*, Bradford Co., 1.5 mi. n.-nw. of Wyalusing, along Susquehanna River, wooded crest of cliffs, June 8, 1938 (G). DISTRICT OF COLUMBIA: *T. A. Williams*, Rock Creek, May 1, 1898 (G). WEST VIRGINIA: *Eggleston 4344*, White Sulphur Springs, May 17–18, 1909 (G). VIRGINIA: *Small*, Smyth Co., E. Marion, on Stalie's Knob and Stalie's Creek, alt. 2400 ft., May 18–19, 1892 (M); *Hunnewell*, Bath Co., Hot Springs, woods, May 11, 1916 (G); *A. H. Curtiss*, Bedford Co., April 15, 1871 (G); *Fogg 14,589*, Giles Co., 2¼ mi. ne. of Mountain Lake P. P., Salt Pond Mt., alt. 3800 ft., June 22, 1938 (G); *Churchill*, Rockbridge Co., Goshen, rocky woods, April 28, 1915 (M). NORTH CAROLINA: *Ashe*, Mitchell Co., Frank P. O., May 11, 1893 (NC); *Peattie 1667*, Polk Co., Tryon, in cool mountain woods, April 20, 1922 (NC); *Barksdale*, Bat Cave Mountain, April 19, 1937 (NC). SOUTH CAROLINA: *House 2064*, Oconee Co., Tamassee Falls, May 5, 1906 (M); *House 1855*, Oconee Co., Clemson College, near Seneca River, low woods, April 16, 1906 (M). GEORGIA: *Leeds 2012*, Union Co., 1 mile n. of Frogtown Gap on branch of Helton Creek, June 1, 1934 (ANS); *Churchill*, Lookout Mountain, near the line between Tennessee and Georgia, April 19, 1906 (G). ONTARIO: *J. Macoun 33,609*, Niagara, May 9, 1901 (C, G); *T. M. C. Taylor*

et al. 2277, Algoma District, Carp River, mixed woods, bottomlands, July 15, 1935 (C); *J. Macoun 72,515*, near St. Thomas, woods, June 24, 1907 (C, type of *T. dioicum* var. *adiantinum*); *J. Macoun 33,608*, Lake Huron, Pt. Edward, June 12, 1901 (G, NY). MICHIGAN: *Greenman 3356*, Sawyer Beach, Hemlock Dune, May 5, 1912 (G). OHIO: *Clavenger*, Columbus, June, 1903 (US); *Gleason*, north of Columbus, rich wooded hillsides, May 13, 1905 (G); *Webb 496 & 497*, Portage Co., Nelson Ledge, May 3, 1902 (G). INDIANA: *Deam 15,851*, Noble Co., about 4 mi. northwest of Kendallville, in woods, June 6, 1915 (G). KENTUCKY: *Demaree 11,252*, Greenup Co., South Portsmouth, fertile river-hillsides, April 21, 1935 (M); *W. A. Anderson 407*, Fayette Co., Elklick, March 26, 1927 (G); *Blumer 238*, Louisville, River Road, woods, April 2, 1933 (G); *W. A. Anderson 9*, Henderson Co., Robard, April, 1923 (G). TENNESSEE: *Ruth 383*, Knoxville, Tennessee River, bluffs, May 20, 1894 (G); *Ruth*, Knoxville, rocky woods, April, 1896 (M); *Eyles 7713*, Obion Co., near Walnut Log, bluff, April 25, 1941 (G). ALABAMA: *Mohr*, Huntsville, Mount Sano, in sylvis umbrosis, May 8, 1881 (F); *Mohr 66*, near Huntsville, Mount Sano, upper districts, rich woods, May 1, 1881 (US); *Harper 3340*, Jackson Co., southeast of Scottsboro, northwest slope of Sand Mountain, among limestone rocks in woods, April 17, 1935 (G, NY, US). ILLINOIS: *Pease 11,831*, Champaign Co., Urbana, moist bank near Crystal Lake, April 27, 1909 (G); *Gleason 527*, Urbana, hillside, April 28, 1899 (G). MINNESOTA: *Pammel 204*, Cass Lake, abundant in pine woods with Hard Maple and Basswood, July 28, 1925 (G); *M. L. Grant 2703*, Clearwater Co., Itasca Park, near campus, woods, sand, July 9, 1929 (G); *Sandberg 1148*, Itaska Lake, along stream, July 6, 1891 (US). IOWA: *Pammel*, Ames, College Park, May 28, 1927 (ANS); *Fink*, Fayette, prairies, 1894 (G); *Fink*, 1894 (US); *Fink 56*, Fayette Co., May 15, 1894 (US). MISSOURI: *Steyermark 11,569*, Wayne Co., west of Grenville, along St. Francis River, July 9, 1936 (M); *Steyermark 11,220*, Barry Co., south of Shell Knob, Smith Pond, wooded lime slopes, April 26, 1936 (M); *E. J. Palmer 35,966*, Benton Co., Fredonia, rich woods along bluffs of Osage River, May 22, 1929 (G); *E. J. Palmer 22,826*, Stone Co., Galena, limestone bluffs of the James River, rich woods, May 27, 1923 (M); *Bush 753*, Jackson Co., Courtney, May 2, 1896 (M, US); *Bush 98*, Sheffield, common on rocky hill, May 12, 1898 (G, M, US).

Specimens collected in July at Saint-Pierre are in flower, while in Georgia and Alabama this species matures its fruits in May or June. No specimens were seen either from eastern Québec or from the Maritime Provinces. We do not know if there is any type in existence of *T. pauciflorum* Raf.

Subsectio **Incurvata** subsect. nov. *Plantae* stoloniferae glabrae vel pubescentes. *Pubescentia* si adest e pilis capitatis minutis translucidis. *Folia* supraternatisecta. *Inflorescentia* aphylla vel, parum si foliosa foliis sessilibus, paniculata, apice acuta. *Flores* dioici, rarissime polygami. *Sepala* dimorpha, floris masculi majora. *Filamenta* colorata. *Carpella* matura subsessilia costata apice incurvata, *nervo* dorsali convexiore quam ventrali, pariete saepius incrassato. Nervi carpellorum costis parum distincti. Species typica *Thalictrum venulosum* Trel. sit.

a. Carpella matura haud compressa. . . .*b.*
  b. Stigma (1.0–) 1.5–2.0 (–2.5) mm., venter carpelli maturi 3–4 mm. longus, 1.8–2.4 mm. latus. . . . . .92. *T. venulosum.*
  b. Stigma (2.0–) 2.5–4.0 (–5.0) mm., venter carpelli maturi 4–6 mm. longus. . . .*c.*
    c. Venter carpelli maturi 2.5–2.7 mm. latus. . . . . .93. *T. confine.*
    c. Venter carpelli maturi 2.0–2.3 mm. latus. 94. *T. confine,* var. *Greeneanum.*
a. Carpella matura paullum compressa. . . .95. *T. confine,* var. *columbianum.*

92. T. venulosum Trelease, Proc. Bost. Soc. Nat. Hist. **23:** 302, 1886. *T. campestre* Greene, Erythrea, **4:** 123, 1896. *T. Lunellii* Greene, Midl. Nat. **1:** 102, 1909. *T. thyrsoideum* Greene, Midl. Nat. l. c. 1909. *T. thyrsoideum sylvanum* Lunell, Amer. Midl. Nat. **2:** 157, 1912. *Leucocoma Lunellii* (Greene) Lunell, l. c. **4:** 361, 1916. *L. thyrsoidea* (Greene) Lunell, l. c. 361, 1916. *L. thyrsoidea sylvana* (Lunell) Lunell, l. c. 361, 1916. *Planta* 20–75 cm. *Folia* basilaria 1–2, caulinaria 1–3 in planta. Pedunculi fructuum 0.3–1.5 cm., conspicue ascendentes vel appressi, saepius gemini. *Sepala* floris masculi 3.5–4.0 mm. longa, foeminei ca. 2 mm. *Filamenta* 3–4 mm. *Antherae* (2.0)–2.5–3.5 mm., *acumine* ca. 0.1 mm. *Stigma* (1.0)–1.5–2.0–(2.5) mm. *Carpella* matura stipite 0–0.3 mm., ventre 3–4 mm. longo et 1.8–2.4 mm. lato. Floret Majo, Junio, Julioque.—Northwest America: *Franklin Expedition* (G, type of *T. venulosum*); *Richardson 207* (G, paratype). Québec: *D. Potter 380,* James Bay, mouth of the Abitibi River, bank opposite Allen Island, June 30, 1929 (G); *Roy,* comté de Labelle, Bellerive, 9 juin 1935 (G). Ontario: *C. S. Williamson 2028 & 2032,* vicinity of Fort Williams, Kaministiqua, Aug. 2, 1912 (ANS); *D. Potter 379,* James Bay, Charlton Island, 3 miles N. W. of Hudson Bay Co.'s Post, sand along fresh-water creek, July 6, 1929 (G). Wisconsin: *Griscom,* Sawyer Co., R. R. right of way north of Hayward, June 11, 1928 (G). Manitoba: *E. L. Greene,* near Carberry, prairies, 1890 (G-ND, type of *T. campestre;* G, photo of type; NY, isotypes); *Scamman 2892,* Riding Mountain National Park, Clear Lake, alt. 2016 ft., Aug. 29–Sept. 2, 1941 (G); *Macoun & Herriot 69,804,* 6 mi. east of Forest, June 19, 1906 (G); *Herriot*

69,803, Portage La Prairie, May 31, 1906 (G). Minnesota: *Chandonnet*, Ottertail Co., Ottertail Lake, prairies, June 8, 1910 (N-ND). North Dakota: *Stevens 177*, Cass Co., Fargo, open places in woods, June 30, 1936 (G, F); *Lunell*, Benson Co., peninsula of Lake Ibsen, in woodlands, May 30, 1910 (NY, syntype of *T. thyrsoideum sylvanum*); idem, May 28 (N-ND, syntype of *T. thyrsoideum sylvanum*); idem, May 24 (F, NY, syntypes of *T. thyrsoideum sylvanum*); *Lunell*, Ward Co., Minot, along Mouse River, in timber, July 1, 1909 (G-ND 14394, type of *T. Lunellii;* G, photo of type; N-ND, isotype); *Lunell 76*, Benson Co., Lees, in dry soil on the prairies, June 10, 1909 (G-ND, type of *T. thyrsoideum;* G, photo of type; N-ND, NY, isotypes). South Dakota: *E. J. Palmer 27,198*, Lawrence Co., Boulder Canyon near Deadwood, wet rocky ground along brook, June 12, 1929 (G); *Hayward 1404, 1425, 1840, 2060, 2200, 2304 & 2410*, Black Hills, various localities, 1927 (F). Saskatchewan: *Bourgeau*, 1857–58 (G, paratype of *T. venulosum*); *J. Macoun 2952*, Crane Lake, June 9, 1894 (G); *Macoun & Herriot 69,802*, Tramping Lake, Aug. 4, 1906 (G); *J. Macoun 12,316*, near Prince Albert, lat. 53°, July, 1896 (G). Alberta: *J. Macoun 59,524*, Burnt River, north of Peace River, open prairies, July 19, 1903 (G); *Moodie 936*, Red Deer Valley, vicinity of Rosedale, low ground, alt. 2200–2500 ft., June 1, 1915 (F, G); *Raup 2430, 2433, 2434, 2435a, 2439, 2440, 2442 & 2444*, Wood Buffalo Park, various localities, 1928–29–30 (G). Montana: *B. J. Jones*, Gallatin Co., Sedan, June 11, 1901 (G); *Flodman 485*, Gallatin Co., East Gallatin Swamps, alt. 5000 ft., July 24, 1896 (US). Wyoming: *Clifford Richardson*, Alkali Co., Branch of Sandy R., 1878 (G, paratype of *T. venulosum*); *A. Nelson 7307*, Albany Co., Chug Creek, on the open bottoms, June 29, 1900 (G); *C. Schubert*, Albany Co., Bear Creek about 2 miles from Eagle Peak, and 4 miles from Laramie Peak, Aug. 22, 1899 (US); *Forwood*, Wind River, July 24, 1882 (G).

British Columbia: *Raup & Abbe 3557*, north bank of Peace R., at Taylor Flats, dry bluffs, about 56° 8′ N., 120° 40′ W., alt. 1600 ft., June 12, 1932 (G); *McCabe 674*, Chezacut, very abundant, even in dry sites, Aug. 30, 1933 (UC); *S. Brown 960 & 972*, North Branch Saskatchewan, Kootenay Plains, June 17, 1908 (G). Fig. 92, a–e.

93. T. confine Fernald, Rhodora, **2:** 232, 1900. *T. purpurascens* L. sensu DC. Syst. **1:** 174, 1817. *T. purpurascens* L., β *monoicum* DC. Syst. **1:** 174, 1817. *T. dioicum* × *purpurascens* Trel., Proc. Bost. Soc. Nat. Hist. **23:** 301. 1886. *Planta* 25–120 cm. *Folium* basilarium vel solitarium vel deest, caulinaria 1–5 in planta. *Pedunculi* fructuum (0.5)–1.5–2.5–(3.0) cm. ascendentes. *Sepala* floris maris 2.5–5.0 mm. longa, foeminei 1.5–2.4 mm. *Filamenta* 3.0–4.5–(5.5) mm. *Antherae* (2.0)–3.0–

4.0 mm., *acumine* ca. 0.4 mm. *Stigma* (2.0)–2.5–4.0–(5.0) mm. *Carpella* matura stipite 0.1–0.2 mm., ventre 4–6 mm. longo et 2.5–2.7 mm. lato, *nervis* nonnunquam ramosis sinuosisque. Floret Junio vel Julio et interdum Augusto.—LABRADOR: *J. Fowler*, Lower East Main Coast, Aug. 20, 1892 (US). QUÉBEC: *D. Potter 382*, James Bay, East Main, marshy river bank, July 11, 1929 (G); *Williams & Fernald*, Témiscouata Co., Rivière-du-Loup, rocky bank of the St. Lawrence, Aug. 2, 1902 (G); *Rousseau 26,423*, comté de Rimouski, pointe du Vieux-Bic, sur les schistes, 30 juin, 1927 (G); *Fernald & Pease 25,074*, Matane Co., Ste. Félicité, brookside, July 17, 1922 (G); *Victorin & Rolland 18,777*, archipel de Mingan, île au Marteau, sur les rivages calcaires, 15 juillet, 1924 (G); *Victorin 4288*, Anticosti, cap à l'Ours, Aug. 23, 1917 (G); *Victorin 28,156*, Boucherville, bordant le rivage de l'une des îles, avec *Carex intermedia* et *Carex nutans*, 1 sept., 1928 (G); *Victorin 3233*, St.-Eustache, Aug., 1916 (G); *Ouimet & Fassett 18,100*, Gatineau Co., Hull, June 29, 1934 (C); *C. H. Knowlton*, Philipsburg, dry open woods, shale ledges, July 18, 1931 (G). NEW BRUNSWICK: *Chalmers 844*, Restigouche, Eel River, woods, July 29, 1876 (C, marked by Trelease *T. dioicum* × *purpurascens;* G, same note); *J. Macoun 21,136*, along the St. John, above Woodstock, July 3, 1899 (C, G); *Williams, Collins & Fernald*, Gorge of Aroostook River, Andover, talus from calcareous cliffs, July 17, 1902 (G); *Pease & Edgerton 27,259*, Upper Mangerville, alluvium by St. John R., June 29, 1939 (G); *G. U. Hay*, St. John, Aug., 1890 (G). MAINE: *Fernald*, Aroostook Co., Fort Fairfield, fruits from plant in river-thicket, Sept. 19, 1900 (G, TYPE of *T. confine;* C 69,609, ISOTYPE); *Fernald 215*, Fort Fairfield, abundant in alluvial thickets, fl. June 6, 1901, fr. July 16, 1902 (G, NE). VERMONT: *Eggleston 4869*, Ferrisburg, Gardener's Island, July 17, 1909 (G); *Flynn*, Chittenden Co., Burlington Bay, rocky shore of Lake Champlain, Sept. 8, 1909 (G, NE); *C. H. Knowlton*, Franklin Co., Lake Champlain, Swanton, sandy shore, July 24, 1926 (NE); *C. H. Knowlton*, Grand Isle Co., Grand Isle, swampy woods near Lake, July 24, 1935 (NE). NEW YORK: *House 10,323*, Essex Co., Port Henry, rocky shore of Lake Champlain, July 12, 1924 (G, US). ONTARIO: *J. Macoun 2956*, Ottawa, Rideau Hall, thickets, Aug. 8, 1894 (C, paratype); *D. Potter 381*, James Bay, Moose River, north end of Saw Pit Island, marsh, July 1, 1929 (G); *Pease & Bean 23,557*, Thunder Bay District, W. side of Jack Fish Bay, beside a brook, July 8, 1933 (C, G); *Taylor, Losee & Bannan 905*, Thunder Bay District, Sibley Tp., Talus Bay, gravelly beach, June 24, 1936 (C). MICHIGAN: *Fernald & Pease 3306*, Schoolcraft Co., east of Manistique, glades and openings in thicket bordering calcareous beach of Lake Michigan, July 9, 1934 (G). MANITOBA: *Bourgeau*, Lake Winnipeg Valley,

1857 (G); *G. Gardner*, Moose Factory, South Shore, 19 juin, 1932 (ANS). MINNESOTA: *Lakela 1408* & *1428*, Duluth, June 11 & 19, 1936 (ANS); idem, June 17, 1938 (G). FIG. 93, a–f.

Thalictrum dioicum × *purpurascens* Trel. also included *T. coriaceum* (Britt.) Small. Trelease referred to those plants being "hybrids of *T. dioicum* L. with *T. purpurascens* L. or *polygamum* Muhl." No specimen has been found marked by Trelease *T. dioicum* × *polygamum.* Oddly enough, one of these supposedly hybrid plants comes from a region where the only other *Thalictrum* yet known to occur is *T. polygamum.*

94. T. CONFINE Fern. var. **Greeneanum,** var. nov. *Planta* 30–70 cm. *Folia* basilaria 1–3, caulinaria 1–2 in planta. *Filamenta* 2.5–3.2 mm. *Antherae* 2.5–3.0 mm., *acumine* 0.3–0.7 mm. *Stigma* 2.0–3.0 mm. *Carpella* matura ventre 4.5–5.0 mm. longo et 2.0–2.3 mm. lato. Floret saepius Julio, interdum Junio.—COLORADO: *Parry*, Middle Park, July, 1864 (G, paratype of *T. venulosum*); *Vasey 10B*, Middle Park, 1868 (G, paratype of *T. venulosum*); *Baker 551*, Gunnison, alt. 7680 ft., July 23, 1901 (G, TYPE; NY, US, ISOTYPES); idem *556* (G, US); *Hall & Harbour 8*, lat. 39°–41°, 1862 (F); *Coulter*, Weston's Pass, alt. 11,000 ft., July 18, 1873 (US); *Patterson*, Middle Park, west end, damp plains, July 27, 1875 (F); *B. H. Smith*, Archuleta Co., Pagosa Springs, June 15, 1894 (ANS); *B. H. Smith*, Mineral Co., Wagon Wheel Gap, July, 1882 (ANS). UTAH: *Pennell & Shaeffer 22,522*, Wasatch Co., head of Daniels Canyon, northeast of Hebert, below Daniels', rocky slope, alt. 7900–8000 ft., July 1–2, 1938 (ANS); *Watson 9*, Wahsatch, Provo Canon, July 1869 (US).

E. L. Greene left two unpublished names on sheets of this variety.

95. T. CONFINE Fern., var. **columbianum** (Rydb.), stat. nov. *T. fissum* Greene, Pittonia, **4:** 233, 1901. *T. columbianum* Rydberg, Bull. Torr. Bot. Club **39:** 320, 1912. *T. occidentale* Gray, var. *columbianum* (Rydb.) St. John, Fl. South. Wash. & Adj. Id. 156, 1937. *Planta* 50–80 cm. *Folia* basilaria 0–1, caulinaria 1–3 in planta. *Pedicelli* 0.5–2.5 cm. aetate fructuum maturandorum. *Filamenta* 3–6 mm. *Antherae* 1.5–4.0 mm. *Stigma* 2.0–3.0 mm. *Carpella* matura ventre paullulum compresso, 3–6 mm. longa et 1.8–2.5 mm. lata. Floret Majo, Junio Julioque.—IDAHO: *Mulford*, De Lamar, alt. 7000 ft., July 7, 1892 (G, paratype of *T. columbianum*). OREGON: *Cusick 1137*, 1886 (NY, paratype of *T. columbianum*); *Cusick 1337*, Mts. E. Oregon, a form not common in the mountains, June, July, 1886 (G, NY, paratypes of *T. columbianum*); *Henderson 9056*, Harney Co., Steins Mts., near Sheep Camp, moist bottoms in aspen woods,

alt. 5500 ft., June 15, 1927 (CA); *Henderson 9058*, Harney Co., 15 miles above Burns, up Silvies River, moist sunny flats, June 13, 1927 (CA); *Cusick*, Stein's Mountains, at the head of Wild Horse Creek, July 14, 1898 (G-ND, type of *T. fissum;* G, photographs of the type). WASHINGTON: *Elmer 599*, Okanogan Co., Loomiston, Mount Chapaca, abundant in the meadow on the south slope, Aug., 1897 (NY, TYPE of *T. columbianum;* BG, US, ISOTYPES); *G. R. Vasey 155*, 1899 (G, NY, US, paratypes of *T. columbianum*); *Henderson 2367*, Yakima Co., June, 1892 (G); *Piper 1467*, Withman Co., Pullman, June 26, 1893 (G); *Lyall*, Pend d'Oreille River, 1861 (G).

BRITISH COLUMBIA: *Raup & Abbe 2642*, vicinity of Hudson Hope, south slopes of Peace River Valley, about 56° 1′ N., 121° 53′ W., June 21, 1932 (G); *McCabe 2407*, fourteen miles north of Kamloops, moist hollow in open range, June 13, 1935 (UC); *McCabe 8232*, one mile southeast of New Hazelton, semi-open forest edge, border of bog, Aug. 9, 1940 (UC).

Subsectio **Clavocarpa** subsect nov. *Plantae* glabrae elatae rigidae. Species duae, alia stolonifera alia haud. *Caulis* saepius glauca. *Folia*, nisi inferiora, sessilia in apice dilatationis petiolaris. *Inflorescentia* paniculata copiosa. *Sepala* lanceolata. *Stigma* bialatum. *Carpella* matura recta stipitata, *nervis* exsertis sublatis in costis obtusis, nervo ventrali convexiore quam dorsali. Species typica *Thalictrum coriaceum* (Britt.) Small sit.

Planta stolonifera; antherae luteae vel viridulae; carpella matura ventre lanceolato . . . . 96. *T. Steeleanum.*
Planta haud stolonifera; stamina imprimis lutea, deinde purpurascentia; carpella matura ventre ovoideo . . . . 97. *T. coriaceum.*

96. T. **Steeleanum,** sp. nov. *Planta* glabra stolonifera 1.0–1.5 m. *Foliolae* majusculae, 2.5–7.0 cm. latae, interdum subquadratae. *Sepala* mascula 4–5 mm. longa, foeminea ovata ca. 2 mm. longa. *Filamenta* saepius lutea, interdum purpurascentia 4.0–4.5 mm. *Antherae* saepius luteae, interdum viridulae, lineares, 3.2–4.5 mm., *acumine* 0.4–1.0 mm. *Stigma* 2.0–2.8 mm. *Carpella* matura saepius purpurascentia, *stipite* 0.6–1.8 mm. longo, ventre lanceolato 4.0–6.5 mm. longo et 1.7–2.2 mm. lato, *nervis* saepius undulatis. Floret Majo et interdum Junio.—PENNSYLVANIA: *Brown & Saunders*, Somerset Co., near Rockwood, along Casselman River, on opposite sides of the river, June 3, 1899 (ANS). MARYLAND: *Steele*, C. & O. Canal, April 11, 1903 (US); *Steele*, bank of Potomac above D.C., July 23, 1902 (G, NY); *Steele*, Potomac, near the Md. line, Feeder Dam Island, July 10, 1902 (NY); *Steele*, idem, May 10 (G, NY); *Steele*, bank of Potomac, above D.C., July 26, 1902 (G, NY); *E. L. Morris 1527*, Montgomery Co., Plummers Island, alluvial woods, May 18, 1902 (BG); *Long & Bartram 1292*, Cecil Co.,

north of Conowingo, woods, June 1, 1913 (G, TYPE); idem *1287* & *1289* (ANS); *Hitchcock 12,902a,* Great Falls, woods along canal, June 21, 1917 (G); *Shriver,* Cumberland, 1894 (NY). VIRGINIA: *Allard 2873,* Fauquier Co., near Markham, woods at top of Rattlesnake Mountain, abundant and in full bloom, underground rhizomes a rich golden yellow, May 30, 1937 (G); *E. L. Morris 2361,* Falls Church, dark woods, May 1896 (BG); *Camp 1174a* & *1174b,* Shenandoah National Park, south and southeast of Skyland, alt. about 3500 ft., May 25, 1936 (NY); *Rawlinston 16,* Madison Co., near Hoover's Camp, June 22, 1934 (US); *Wherry & Pennell 13,344,* Page Co., southeast of Luray, Stony Man Mountain, Aug. 24, 1927 (M). FIG. 96, a–d.

97. T. CORIACEUM (Britt.) Small, Mem. Torr. Bot. Club, **4:** 98, 1893. *T. dioicum* L., β? *stipitatum* Torr. & Gray, Fl. N. Amer. **1:** 38, 1838. *T. dioicum* L., var. *stipitatum* Lecoyer, Bull. Soc. Bot. Belg. **24:** 142, 1885, pars. *T. dioicum* L., var. *coriaceum* Britton, Bull. Torr. Bot. Club, **25:** 136, 1898. *T. caulophylloides* Small, Bull. Torr. Bot. Club, **25:** 136, 1898. *Planta* glabra, haud stolonifera, 65–100–(150) cm. *Foliolae* (1)–3–(7) cm. latae. *Sepala* floris masculi 3.5–4.0 mm. longa, foeminei fere lanceolata 1.5–2.0 mm. longa. *Filamenta* 4.5–5.0 mm. *Antherae* 2.0–3.5 mm., *acumine* ca. 0.4 mm. *Stigma* 1.5–2.5 mm. *Carpella* matura *stipite* 0.3–5.5 mm., ventre ovoideo 2.3–4.0 mm. longo et 1.3–2.0 mm. lato, *nervis* paululum sinuosis. Floret Junio, rarissime Majo vel Julio.—WEST VIRGINIA: *Britton,* White Sulphur Springs, May 16, 1897 (NY). VIRGINIA: *Small,* Smyth Co., slope of White Rock Mountain, alt. 3500–4000 ft., June 21, 1892 (F, M); *A. H. Curtiss,* Bedford Co., 1871 (F, G, M); *E. S. & Mrs. Steele 146,* near Luray, Stony Man Mountain and vicinity, alt. 3600 ft., Aug. 18, 1901 (G, M, NY, US); *Steele,* Augusta Co., vicinity of Augusta Springs, over meter high, alt. + 1200, Sept. 8, 1908 (M, US). NORTH CAROLINA: *M. A. Curtis,* Bald Mt. (G, type of *T. dioicum* β? *stipitatum* Torr. & Gray); *Small & Heller 263,* Watauga Co., Blowing Rock Mountain, alt. 4000 ft., July 29, 1891 (NY, TYPE of *T. dioicum,* var. *coriaceum;* US, ISOTYPE); *Porter,* Mtns., June 28, 1880 (ANS, NY, paratypes of var. *coriaceum*); *Small & Heller,* Blowing Rock Mountain, alt. 4000 ft., June 10–20, 1891 (F, NY, paratypes of var. *coriaceum*); *Small & Heller,* eastern slopes of Blowing Rock Mountain, July 7, 1891 (F, paratype of var. *coriaceum*); idem *491* (ANS, F, M, paratypes of var. *coriaceum*); *Small & Heller,* on the road between Blowing Rock and Shull's Mill, June 16–17, 1891 (F, M, NY, paratypes of var. *coriaceum*); *Small & Heller 491.* Caldwell Co., summit of Stone Mountain, July 9, 1891 (ANS, US, paratypes of var. *coriaceum*); *House 4346,* Transylvania Co., Pisgah Ridge, alt. 4000–5000 ft., July 4, 1909 (US); *Biltmore Herbarium 6043a,* Buncombe Co., slopes of Cedar Cliff

Mountain, rich soil, May 24, 1898 (NY); *Mohr*, Grandfather Mountain, rich woods, July 27, 1894 (US). Georgia and Carolinas: *Buckley*, in mountibus Carolinae et Georgiae (M, paratype of *T. dioicum* × *purpurascens*); *Wright*, N. Georgia, 1875 (G). Kentucky: *Kearney 290*, Harlan Co., Big Black Mountain, Aug., 1893 (G, NY). Tennessee: *Svenson 8309*, Sevier Co., Thomas Ridge, south of Indian Gap, Aug. 12, 1935 (BG); *Ruth 1800*, Blount Co., Cade Cove Mountain, mountainsides, July, 1892 (NY, type of *T. caulophylloides*); *Eggert*, Davidson Co., woods, July 13, 1897 (M, NY). Fig. 97.

(*To be continued*)

ACER GRANDIDENTATUM IN OKLAHOMA

Elbert L. Little, Jr.

This summary of *Acer grandidentatum* Nutt., bigtooth maple, in the Wichita Mountains, Oklahoma, is suggested by a recent note by Milton Hopkins (Rhodora **45**: 273–274. 1943), questioning the presence of this species there. Hopkins referred to the maple of the Wichita Mountains in southwestern Oklahoma as: "*Acer saccharum* (in that region treated by most Oklahoma botanists as *A. grandidentatum*, but clearly not that, although further study may reveal it to be merely an isolated variety of the typical New England sugar maple)." He explained use of the name *Acer grandidentatum* in this way:

> "Inasmuch as none of the authors prior to 1912 include *A. grandidentatum* in the flora of this state, it seems quite probable that the Wichita Mt. specimens were first identified (erroneously?) by G. W. Stevens (about 1915–16) as that plant, and that succeeding authors merely accepted his determination without further questioning."

The sugar maples and related species are a variable group, and the distinctions are based largely upon variable leaf characters. The name of the eastern sugar maple, familiar to the present generation as *Acer saccharum* Marsh. and to past generations as *Acer saccharinum* Wangenh. and *Acer barbatum* Michx., must now be changed, with regret, to *Acer saccharophorum* K. Koch, as Mackenzie (Rhodora **28**: 111–112, 233–234. 1926), Rousseau (Nat. Canad. **67**: 161–200, 201–224, illus. 1940), and others have concluded. *Acer grandidentatum* Nutt., the closely related bigtooth maple of western United States, apparently is a parallel species developed from a common ancestor following long

geographic separation after the interior region became less humid. It is regarded as a distinct species by modern authors, although Sargent once reduced it to a variety, *Acer barbatum* var. *grandidentatum* (Nutt.) Sarg. (Silva No. Amer. **2:** 100. 1892) and Sudworth did likewise as *Acer saccharum* var. *grandidentatum* (Nutt.) Sudw., which Sargent (Silva No. Amer. **13:** 8. 1902) adopted. Both afterwards recognized *Acer grandidentatum* as a species, however.

The isolated maple of canyons and hillsides in the Wichita Mountains in Comanche County, southwestern Oklahoma, is of unusual interest, whatever its name and relationships. The following early collections from this locality are represented in the United States National Herbarium: S. B. Detwiler, Sept. 30, 1902 (Nos. 1,583,709 and 1,583,695, the latter sheet a variation approaching *Acer saccharophorum* var. *sinuosum* (Rehd.) Rousseau, discussed below); J. H. Gaut 166, May 5, 1904; Vernon Bailey, Aug. 5, 1906; and G. W. Stevens 1353, June 25, 1913. Though Detwiler may have discovered the station, Stevens was the first to identify the maple as *Acer grandidentatum* Nutt.

Stevens recorded *Acer grandidentatum* Nutt. in his unpublished Flora of Oklahoma (Ph. D. thesis, Harvard Univ. 1916). As Hopkins stated, *Acer grandidentatum* was cited from the Wichita Mountains in 1922 by Sargent (Man. Trees No. Amer. Ed. 2, 693. 1922). The name "G. W. Stevens" appearing after this record may have meant merely that Sargent was giving Stevens credit for this remarkable range extension and not necessarily that Stevens was the sole authority for this identification. It is difficult to believe that Sargent would have accepted a range extension so great without examining Stevens's specimen in the Gray Herbarium. In this manual, Sargent cited the collectors' names under range extensions of various species. For example, four persons were mentioned under *Amelanchier canadensis* on page 315. Also in 1922, Ashe recorded from the Wichita Mountains, without mentioning *Acer grandidentatum*, a maple with a new combination, *Acer barbatum sinuosum* (Rehd.) Ashe (Rhodora **24:** 78. 1922), based upon *Acer sinuosum* Rehd. and as a range extension of more than 300 miles north of the only previously known locality. He concluded from the Wichita Mountain material that *sinuosum* was related to *Acer barbatum*

Michx., which he used in the sense of *Acer floridanum* (Chap.) Pax.

Some of the later records of *Acer grandidentatum* from Oklahoma may have been taken from Sargent's Manual or from Sudworth's Check List of Forest Trees of the United States (U. S. Dept. Agr. Misc. Circ. **92,** 189. 1927), which incorporated Sargent's data on ranges. Hopkins cited several publications listing *Acer grandidentatum* from Oklahoma. Other specialists independently have identified the Wichita Mountain maple as *Acer grandidentatum.* Hopkins alone refers it to *Acer saccharum.*

Ernest J. Palmer (Notes on some plants of Oklahoma. Jour. Arnold Arboretum **15:** 127–134. 1934) observed the maple in the Wichita Mountains in July, 1933, and wrote under the name *Acer grandidentatum* (p. 131): "This is the most eastern known limit for this western species and its presence here is particularly interesting as indicating a former invasion of Rocky Mountain plants into the region."

In his list of the flowering plants of the Wichita Mountains Wildlife Refuge (formerly Wichita National Forest and Game Preserve), Cletis T. Eskew (Amer. Midland Nat. **20:** 695–703. 1938) noted that one of the most unusual disjunct plant species of that region was *Acer grandidentatum.*

I collected this maple on my first trip to the Wichita Mountains in June, 1926. At that time Frank Rush, formerly supervisor of the Wichita National Forest, told me that he had known of the maple ever since he first became connected with the United States Forest Service there, probably about 1910.

Another disjunct distribution of maple is in the Caddo County Canyons of west central Oklahoma, to which Hopkins referred as *Acer saccharum.* From 1930 to 1933, while a member of the faculty of Southwestern State Teachers College (now Southwestern Institute of Technology) at Weatherford, Oklahoma, I had good opportunities on field trips to study the maples of these two areas. At first I thought, like Hopkins, that the maples of the two areas were the same as the eastern species. Promptly in 1930 I sent specimens of both for determination to the Arnold Arboretum, where Alfred Rehder identified the maple of the Caddo County Canyons as *Acer saccharum* Marsh. and the maple of the Wichita Mountains as *Acer grandidentatum* Nutt.

The remarkable occurrence of *Acer saccharophorum* K. Koch (formerly known as *Acer saccharum*) in the Caddo County Canyons about 175 miles from the western limit of the continuous range of the species in eastern Oklahoma (such as in eastern Muskogee County), has been discussed elsewhere by myself (Okla. Acad. Sci. Proc. **16:** 47. 1936. The vegetation of the Caddo County Canyons, Oklahoma. Ecology **20:** 1–10. illus. 1939) and by Hopkins (RHODORA **40:** 431–433. 1938). *Acer saccharophorum* is present as the dominant species in four moist, sheltered canyons near Hinton in Caddo and Canadian Counties, 50 to 75 miles northeast of the Wichita Mountains in Comanche County, which adjoins Caddo County. The maples of the Caddo County Canyons, which reach a size of 75 feet in height and 27 inches D. B. H. have been regarded generally as relics of a more humid period when the range was continuous westward to this point.

In discussing the vegetation of the Caddo County Canyons, I noted that the eastern sugar maple was absent from the Wichita Mountains, though certain eastern species not found in the canyons occurred there (Ecology **20:** 9. 1939). I stated:

"One of the most unusual disjunct species in Oklahoma is the western, parallel species of sugar maple, the bigtooth maple, *Acer grandidentatum*, represented in the Wichita Mountains at the easternmost limit and only Oklahoma station. This species of higher zones in the Rocky Mountains from Montana to Coahuila is found nearest in mountains of western Texas 400 miles southwest of the Oklahoma location.

"These two maples of eastern and western forests thus are separated by only 50 miles and almost meet across the grassland in Oklahoma . . ."

The two maples 50 miles apart in adjacent Oklahoma counties are very different in habit in the field and are distinguishable in herbarium specimens by foliage. The maple of canyons and hillsides in the Wichita Mountains is not a large, straight forest tree, as noted for the maple of the Caddo County Canyons, but is shrubby, branched, and only about 10 feet high. In the Rocky Mountains *Acer grandidentatum* has a bushy habit also, though it is generally a small tree. The leaves of the Wichita Mountain maple differ generally in being smaller, thicker, with fewer lobes, and with prominent, blunt teeth. The leaves are nearly glabrous underneath, as in some western specimens, though leaves of *Acer grandidentatum* commonly are pubescent beneath.

The nearest areas of related maples are approximately as follows: *Acer leucoderme* Small of southeastern United States reaches its known western limit in McCurtain County, southeastern Oklahoma, where I discovered it in 1930 (Little, Elbert L., Jr., and Olmsted, Charles E. Okla. Acad. Sci. Proc. **15:** 47. 1935; **16:** 59. 1936). *Acer floridanum* (Chapm.) Pax of the southeastern States extends to southern Arkansas and eastern Texas. *Acer saccharophorum* var. *sinuosum* (Rehd.) Rousseau is known from the Edwards Plateau of Texas, about 300 miles south of the Wichita Mountains. *Acer grandidentatum* Nutt., of the Rocky Mountains, is present in mountains of southern New Mexico and on the Guadalupe, Davis, and Chisos Mountains of southwestern Texas about 400 miles from the Wichita Mountains. *Acer mexicanum* A. Gray occurs in Nuevo León, northeastern Mexico.

To the many combinations already made among these maples, I wish to add the following one:

Acer grandidentatum var. **sinuosum** (Rehd.) Little, comb. nov. *A. sinuosum* Rehd. in Sarg., Trees and Shrubs **2:** 255, pl. 195. 1913. *A. saccharum* var. *sinuosum* (Rehd.) Sarg., Bot. Gaz. **67:** 234. 1919. *A. barbatum sinuosum* (Rehd.) Ashe, Rhodora **24:** 79. 1922. *A. subglaucum sinuosum* (Rehd.) Bush, Amer. Midland Nat. **12:** 503. 1931. *A. saccharophorum* var. *sinuosum* (Rehd.) Rousseau, Nat. Canad. **67:** 221. 1940.

The maple of the Edwards Plateau of southwestern Texas, var. *sinuosum*, is more closely related to and nearer geographically to *Acer grandidentatum* Nutt. than to *Acer saccharophorum* K. Koch. F. Raymond Fosberg, who is studying these maples, has suggested to me this relationship of var. *sinuosum* also. Sudworth (U. S. Dept. Agr. Misc. Circ. **92:** 188. 1927) noted that *Acer saccharum* var. *sinuosum* was similar in general appearance to *Acer grandidentatum*, *Acer mexicanum*, and *Acer floridanum*, but closely related to the latter species.

In the Wichita Mountains there are intergrades towards var. *sinuosum*, which variety was recorded from this locality by Ashe (Rhodora **24:** 79. 1922), as stated above. One of the two fruiting specimens of *Acer grandidentatum* collected there Sept. 30, 1902, by S. B. Detwiler (U. S. Natl. Herb. No. 1,583,695) is of this intergrade, with the leaves smaller, three-lobed, and the

two lowest veins marginal near the base. However, a few leaves have more lobes and teeth, as in *Acer grandidentatum*. Detwiler's other specimen collected the same day has the ordinary foliage of *Acer grandidentatum*. In 1930 I collected there material with three-lobed leaves approaching var. *sinuosum* on twigs of a tree with the other leaves of the common form. Apparently intergrades towards var. *sinuosum* are rare in the Wichita Mountains.

FOREST SERVICE,
United States Department of Agriculture,
Washington, D. C.

AFFINITIES OF SEDUM NEVII.—Clausen and Uhl (1943) wrote: "Cytologically, the relationships of *Sedum nevii*, with a haploid number of 6, are obscure."

It was suggested (Baldwin, 1943) that *S. Nevii* Gray represents a 6-chromosome tendency in the evolution of the genus which, through amphidiploidy—with subsequent doubling of chromosomes—contributed to the formation of *S. pulchellum* Michx. Relative to that interpretation Dr. R. M. Harper, in a letter of March 12, 1943, stated: "I still think there is more than one form that has passed for *S. pulchellum* in Alabama". As occasion allows the matter will be investigated: one rather expects to find there a tetraploid race of *S. Nevii*. And it may be that *S. pulchellum* is an aneuploid derivative of such a plant rather than being the stabilized product of a wide hybridization. However, the earlier analysis appears to be more likely.

It is my opinion, based on observations in the field, garden, and laboratory, that *S. Nevii* ($n = 6$) through fusion with *S. ternatum* Michx. ($n = 8$) gave rise to *S. Beyrichianum* Masters ($n = 14$). Taxonomists long confused *S. Nevii* and *S. Beyrichianum* (Baldwin, 1942a): competent botanists sometimes fail—in spite of the quite different aspect of *S. ternatum*—to distinguish among these three species in the garden. They are all white-flowered (as are also certain strains of *S. pulchellum* which more typically has pink petals); in Virginia they all bloom in the spring. They grow well under comparable conditions, but it would appear from cultural experience that *S. Beyrichianum* has the greatest ecological amplitude, as might be predicted on the

grounds that it is the supposed amphidiploid result of the others. That this species ($2n = 28$ & 56) has a more restricted range than *S. ternatum* ($2n = 16$, 24, 32, & 48) may be attributed to the greater age and earlier autotetraploidy of the latter: it was as a tetraploid that *S. ternatum* has spread (Baldwin, 1942b). Reaction to fixing and staining in cytological preparations is similar in the three species.

S. ternatum and *S. Beyrichianum* exhibit a great range in size of chromosomes. These species like *S. Nevii* are easy to handle microtechnically: chromosome constrictions show up well. Accordingly, the alloploid origin of *S. Beyrichianum* herein suggested can be readily subjected to idiogramic testing. That will in time be done. Initial alignments of chromosomes lend support to the hypothesis.

Clausen and Uhl (1943) first reported tetraploidy in *S. Beyrichianum:* $n = 28$.

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——— 1942b. Am. Jour., Bot. **29**: 283–286.
——— 1943. Bull. Torr. Bot. Club **70**: 26–33.
Clausen, R. T. & Uhl, C. H. Brittonia **7**: 33–46.

J. T. Baldwin, Jr., The Blandy Experimental Farm, Boyce, Virginia.

Lycopus amplectens, var. pubens in New England.—When, in Rhodora, xlvi. 56 (1944), I pointed out that we must take up in place of *Lycopus sessilifolius* Gray (1870) the earlier name, *L. amplectens* Raf. (1840), I did not mention *L. pubens* Britton ex Small (1903) because that southern plant of "Fla. to Miss. and S. C." was outside the region I best know. Now, however, in studying the genus, I find that, whereas typical glabrous-leaved *L. amplectens,* with the stem glabrous or only minutely puberulent, occurs in southeastern Massachusetts, southern mainland Rhode Island and southern Connecticut and on Long Island and in New Jersey, the plant of Block Island, off the Rhode Island coast, is inseparable from the type-material of *L. pubens* in having the upper internodes, the lower young leaf-surfaces and the calyces softly white-pilose; and Mr. Long writes me that this variety occurs at scattered stations in southern New Jersey. The type-number from Duval County,

Florida, *Curtiss*, no. 1990*, was distributed with a printed label bearing an apparently unpublished name of Asa Gray's, as a varietal designation of the plant under *L. sessilifolius.* Curtiss also distributed his no. 5579 with the same varietal name and Gray had written it on material from the same locality, near Jacksonville, as early as 1880. When *L. pubens* was published as a species the appropriate name was already at hand: Gray's and Curtiss's disposition of the plant, however, seems right. Under the new dispensation it becomes

LYCOPUS AMPLECTENS Raf., var. **pubens** (Britton), stat. nov. *L. pubens* Britton ex Small, Fl. Se. U. S. 1049 and 1337 (1903).

Like so many coastal plain species *Lycopus amplectens* has a strikingly disrupted range: on the coastal plain from Mississippi to Florida, thence north to South Carolina, with old records from eastern North Carolina; mountains of western North Carolina (open marsh near Edneyville, Henderson Co., *Correll*, no. 3288, distrib. as *L. virginicus*); coastal plain and adjacent areas, New Jersey, Long Island, southern Connecticut, southern Rhode Island and southeastern Massachusetts; northwestern Indiana.

That is a fairly typical disrupted range. Here is what we know of *L. amplectens*, var. *pubens:* coastal plain, Mississippi to northern Florida, north to South Carolina; southern New Jersey; Block Island, RHODE ISLAND: shore of Fresh Pond, August 21, 1913, *Fernald, Hunnewell & Long*, no. 10,318. In collecting the flora of Block Island, Long and I once reached the conclusion: "If a specialty is on Cape Cod it will not be on Block Island; if it is a specialty of Block Island it will not be on Cape Cod." Like Willis's "Age and Area", which started out as a "law", later became, in his own words, a "hypothesis" and finally "merely a corollary", the dictum about the Block Island flora must not be taken too seriously!—M. L. FERNALD.

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Vol. 46. **December, 1944.** **No. 552.**

AMERICAN THALICTRA AND THEIR OLD WORLD ALLIES

Bernard Boivin

(*Continued from page 445*)

Subsection **Compressa** subsect. nov. *Plantae* erectae rigidae. *Folia* supraternatisecta. *Radix* plus minusve stolonifera. *Filamenta* purpurascentia. *Antherae* luteae. *Stigma* bialatum. *Carpella* matura saepius valde reflexa plus minusve compressa, inflata tamen, nervosa vel costata, costis si adsunt obtusis et nervis obscuris. Crassitudo carpelli dimidias latitudinis vel aequat vel superat. *Nervus* ventralis carpelli convexior quam dorsalis, vel ventralis basis convexior quam dorsalis basi et dorsalis apex convexior quam ventralis apex. Species typica *Thalictrum occidentale* Gray sit.

a. Crassitudo carpelli maturi dimidias latitudinis aequat. Venter ejusdem ovatus costatus, sesquies longior quam latus....................................98. *T. nigromontanum.*
a. Crassitudo carpelli latitudinem subaequat. Carpella matura nervosa, ter vel quater longiora quam lata....*b.*
  b. Carpella matura divaricata stipitata, ventro lanceolato. Inflorescentia ampla ad 50 cm. longa et foliosa....*c.*
    c. Stigma 3.5–4.5 mm................99. *T. occidentale*, var. *typicum.*
    c. Stigma 5–6 mm................100. *T. occidentale*, var. *Macounii.*
  b. Carpella matura conspicue reflexa, ventre ter longiore quam lato. Inflorescentia exserta fere decimetralis
101. *T. occidentale*, var. *palouense.*

98. T. **nigromontanum,** sp. nov. *Planta* 45–65 cm. *Petioli* foliorum superiorum breves. *Inflorescentia* 5–15 cm. longa. *Pedunculi* 1–2 cm. *Sepala* floris maris 3.5–4.0 mm. longa, elliptica, foeminei ca. 1.5 mm. *Filamenta* 5.0–6.5 mm. *Antherae* ca. 3 mm., *acumine* ca. 0.4 mm. *Stigma* 3–4 mm. *Carpella* matura compressa et costata, valde reflexa, *stipite* 0.2–0.3 mm.,

ventre ovato 4–5 mm. longo, 2.5–3.0 mm. lato et ca. 1.5 mm. crasso, *nervis* a costis parum distinctis. Nervus ventralis convexior quam dorsalis. Tempus florendi a lectoribus ignotum, verosimiliter tamen Junium.—South Dakota: *W. P. Carr 135*, Deadwood, shady woods, July 31, 1913 (C, type; F, G, NY, isotypes); *Hayward 847* (in part), Black Hills, Rapid Creek & Dark Canyon, 1927 (F); *Hayward 1331*, Black Hills, Spearfish Canyon, lower 7 miles above fish hatchery, 1927 (F); *Hayward 1337*, Black Hills, Deadwood, near Pinecrest Camp, 1927 (F).

99. T. occidentale Gray. *T. dioicum* L., var. *stipitatum* Lec., Bull. Soc. Bot. Belg. **24:** 142, 1885, pars, nec *T. dioicum*, β? *stipitatum* Torr. & Gray, Fl. N. Amer. **1:** 38, 1838. *T. dioicum* L., var. *oxycarpum* Torr., Bot. Wilkes Exped. **17:** 212, 1874. *Planta* glabra vel puberulens. *Pedunculi* divaricati (1)–2–(5) cm. *Sepala* floris masculi 3.5–5.0 mm. longa et foeminei 1.5–2.5 mm. longa. *Filamenta* (5)–6–7–(10) mm., purpurascentia. *Antherae* 2–4 mm. Carpella matura nervosa, vel *nervo* dorsali convexo et ventrali convexiore, vel dorsali basi concavo et apice convexo.

The form of the fruit is highly variable in this species and transitional forms to other species occasionally occur. This also seems to hold true for the Incurvata and Laminaria. These intermediates seem to point toward the following series: *T. venulosum*—*T. confine*—*T. occidentale*—*T. Fendleri*—*T. polycarpum* in which each species is most closely related to the two adjoining ones. The two varieties given in synonymy cannot at present be related to any of the following three.

99. T. occidentale Gray, var. **typicum.** *T. occidentale* Gray, Proc. Amer. Acad. **8:** 372, 1873. *Planta* 60–120 cm. *Inflorescentia* 20–50 cm. longa, foliosa, *foliis* nonnullis petiolatis et triternatis. *Ovaria* ventro lanceolato, interdum ovato. Stigma 3.0–4.5 mm. *Carpella* matura divaricata, *stipite* 0.4–1.2 mm., ventre lanceolato 6–10 mm. longo, 1.6–2.5 mm. lato. Floret Majo et Junio.—Washington and Oregon: *Hall*, 1871 (G, type; F, isotype); *J. Howell*, Cascades, June, 1879 (G); *J. & T. Howell*, near Cascades, in rich woods, May–June, 1880 (ANS, F, US); *T. Howell*, Cascades, May, 1882 (NY); *Suksdorf 2339*, Skamania Co., near lower Cascades, May 30, 1886 (G); *Epling 5533*, Benton Co., Corvallis, May, 1922 (F); *F. E. Lloyd*, Forest Grove, low grounds, June 1, 1894 (NY); *Henderson 8*, Sandy River, warm rich hillsides, May 21–June 12, 1883 (NY); *Henderson 877*, near Columbia River, along creeks, moist rather open woods, May 27, 1924 (G). Fig. 99.

100. T. occidentale Gray, var. **Macounii** var. nov. *Planta* 80–125 cm. *Inflorescentia* sicut praecedentis. *Pedunculi* (2)–

3–(5) cm. *Ovaria* ventro lanceolato. *Stigma* 5–6 mm. *Carpella* matura *stipite* ca. 0.5, caeteris ut praecedentis. Floret Junio.—BRITISH COLUMBIA: *J. Macoun 77,395*, Vancouver Island, Koksilah River, near Cowichau, July 30, 1908 (NY, TYPE; C, ISOTYPE); *Newcombe 8*, Pr. of Wales Isl., Karta Lake, 1901–02 (F); *Newcombe 416*, Victoria, June 4, 1896 (F); *Lyall*, Vancouver Island (NY); *J. Macoun*, Vancouver Island, Nanaimo, June 10, 1887 (US); *Carter 157*, Vancouver Island, Alberni, Roger Creek, creek-bottom, May, 1915 (G); *Rosendahl 1988*, Vancouver Island, Cameron River Valley, alt. 600 ft., June 28, 1907 (US); *J. Macoun 22*, Vancouver Island, borders of streams, July 10, 1887 (G); *C. B. Wood*, Vancouver's Island, 1859 (G); *J. Macoun 849*, Sproat, woods, June 24, 1890 (C).

101. T. OCCIDENTALE Gray, var. PALOUENSE St. John, Fl. South. Wash. & Adj. Id. 158, 1937. *T. heterophyllum* Nutt. ex Gray, Proc. Amer. Acad. **8:** 372, 1873, ut synonymon dubium, nec *T. heterophyllum* Lej., Rev. Fl. Spa, 109, 1824, nec *T. heterophyllum* Schur ex Verh., Naturf. Ver. Bruenn, **15,** 2: 20, 1877, nec *T. heterophyllum* Turcz. ex Ledeb., Fl. Ross. **1:** 727, 1843. *T. propinquum* Greene, Fedde, Rep. Nov. Spec. **7:** 254, 1909. *T. rainierense* St. John, Madroño, **4:** 114, fig. 1, 1937. *Planta* (15)–60–(90) cm. *Inflorescentia* exserta 5–20 cm. longa, *foliis* reductis sessilibusque. *Pedunculi* divaricati (1)–2–(4) cm. fere omnes ejusdem longitudinis in eadem planta. *Ovaria* ventro persaepius ovato. *Carpella* matura conspicue reflexa, *stipite* 1.2–1.5 mm., ventro 4–7 mm. longo et 1.8–3.0 mm. lato. Floret Junio, Julio interdum quoque Majo et Augusto.—ALBERTA: *J. Macoun 64,406, 64,407, & 64,409*, Lake Louise, July, 1904 (C); *Butters & Holway 83*, Banff, alt. 5400–5800 ft., July 7, 1907 (G, NY); *S. Brown 434*, Pipestone Valley, alt. 6000 ft., July 7, 1906 (G); *Cram*, Crowsnest Forest Reserve, July 3, 1920 (C). MONTANA: *Flodman 484*, Bridger Mts., near The Pass, July 28, 1896 (US); *G. N. Jones 5495, 5315 & 5330*, Glacier National Park, Curbank Creek and Many Glaciers, July, 1934 (G); *J. N. Rose 38*, near Red Lodge, July 25, 1893 (G); *Kirkwood 1876*, Clearwater Forest, on Fish Lake Creek, Aug. 20, 1924 (G); *Watson 7*, Bard Mountain, alt. 7000 ft., July 21, 1880 (G). IDAHO: *Macbride 593*, Elmore Co., Trinity, creek-banks, alt. 4500 ft., Aug. 12, 1910 (C); *Sandberg, MacDougal & Heller 199*, Nez Perces Co., Craig Mountains, vicinity of Lake Waha, alt. 900 m., May 20, 1892 (G); *E. B. & L. B. Payson 2009*, Fremont Co., Henry Lake, aspen groves, alt. 6000 ft., July 14, 1920 (CA, G); *Piper 1468*, Latah Co., Cedar Mountains, July 7 (G); *Macbride 420*, Owyhee Co., Silver City, slopes along streams, alt. 7000 ft., July 18, 1910 (G). WYOMING: *L. O. & R. P. Williams 3028*, Big Horn Co., 10–15 miles east of Kane, west slopes of the mountains, alt. 8000 ft., June 19, 1936 (G); *Goodding 1971*, Carbon Co., Bridger

Peak, moist timbered flats, Aug. 24, 1903 (G); *L. O. & R. P. Williams 3639,* Park Co., Beartooth Lake, in pine woods, alt. 9000 ft., July 21, 1937 (G); idem *3552,* Crazy Woman Creek, July 14 (G); *E. B. & L. B. Payson 2999,* Sublette Co., Gros Ventre Mountains, 15 miles northeast of Bondurant, open slopes, Aug. 13, 1922 (F, G, US); *Williams & Pierson 652,* Teton Co., vicinity of Hoback Canyon, spring-bank, alt. 7000 ft., June 19, 1932 (CA, G). NEVADA: *Nelson & Macbride 1936,* Elko Co., Jarbridge, aspen copses, alt. 7000 ft., July 6, 1912 (G, NY); *Nelson & Macbride 2210,* Elko Co., Mountain City, aspen copses, alt. 7000 ft., Aug. 14, 1912 (G, NY, US); *Maguire & Piranian 15,523,* along Ole Creek, woodlands, June 28, 1934 (G). OREGON: *L. S. Rose 36,476,* Wallowa Co., 1 mi. s. Wallowa Lake, alt. 4600 ft., July 18, 1936 (CA); *Thompson 13,340,* Baker Co., near Cornucopia, rocky slopes of Wallowa Mts., July 18, 1936 (ANS, NY); *Henderson 5454 & 5658,* E. Grant Co., Austin Ranch, 1925 (CA, G); *Nuttall,* Columbia Woods (ANS, G, NY) with *Thalictrum heterophyllum* in Nuttall's handwriting). WASHINGTON: *Piper 2022,* Mt. Rainier, rich meadows, alt. 6500 ft., Aug. 1–15, 1895 (G, isotype of *T. rainierense*); *Piper,* Walla Walla Co., Blue Mts., along streams in woods, July 17, 1896 (G, ISOTYPE of *T. occidentale* var. *palouense*); *Thompson 6945,* Okanogan Co., moist shaded slopes by road to Salmon Meadows, alt. 3500 ft., June 25, 1931 (G); *Thompson 7793,* Chelan Co., Wenatchee Mts., below Stuart Pass, moist alder groves, alt. 4500 ft., July 27–31, 1931 (ANS, G). BRITISH COLUMBIA: *J. M. Macoun 33,606,* Tami Hy Mt., Chilliwack Valley, alt. 5000 ft., July 30, 1901 (G-ND, type of *T. propinquum*); *Heacock 53,* Emerald Lake, Avalanche Path, alt. 4400 ft., June 29, 1904 (G, NY, US, paratypes of *T. propinquum*); *Shaw 970,* in the Big Bend district, about 118° 20′ W., 51° 45′ N., alpine meadow, alt. 6000, July 24, 1905 (G, NY); *McCabe 4924,* Elk River Road, 17 miles north of Natal, edges of openings of green spruce timber, Sept. 8, 1937 (UC); *Raup & Abbe 3867,* along Wicked R., near the Peace, about 56° 4′ N., 123° 39′ W., open woods, July 18, 1932 (G). FIG. 101, a–e.

The type of *T. propinquum* Greene is not in the Herbarium of the Canadian Geological Survey as stated in the original description; similarly with the types of *T. tortuosum* Greene, *T. Mortoni* Greene and *T. glaucodeum* Greene. In his last letter to J. M. Macoun, Greene wrote:

April 28, 1915.

. . . .

Another parcel of your Thalictrum went last night; only a small parcel, of sheets on which I have some notes to make, remains.

. . . .

That "small parcel" apparently was never sent, for 66 of the numbers of the Herbarium of the Geological Survey which are represented in the herbarium at Notre-Dame University, are all missing in the National Herbarium of Canada.

Subsectio **Laminaria,** subsect. nov. *Plantae* persaepius plus minusve stoloniferae. *Carpella* matura valde compressa vel laminaria, *nervis* rugosis, haud costata, vel, si costata, costis acutis. Crassitudo carpelli a dimidiis latitudinis ejus recedit. Species typica *Thalictrum Fendleri* Gray sit.

a. Carpella haud reflexa, ovata ad lanceolata, viridia vel brunnea, plus minusve pubescentia vel interdum glabra, nervis lateralibus raro ramosis et sinuosis, nunquam minute sinuosis, nec anastomosantibus, reticulatis. Planta nunquam pruinosa nec caesia nec glauca. Cauli tamen interdum purpurascens. . . . *b.*

b. Nervi laterales 3 conspicui. Planta pubescens. . . . . . . 102. *T. Fendleri.*

b. Nervus lateralis solitarius vel, si ternatus, medius conspicuor et multo crassior quam duo alii. Plantae saepius glabrae. . . . *c.*

c. Carpella ventre ca. 2.5 mm. longo. . . . *d.*

d. Nervi haud sinuosi. . . . . 103. *T. Fendleri,* var. *Wrightii.*

d. Nervus ventralis, licet alii. valde sinuosi.
104. *T. Fendleri,* var. *sinuosum.*

c. Carpella ventre ca. 5 mm. longo.
105. *T. Fendleri,* var. *quadrinervatum.*

a. Carpella plura vel omnia reflexa, obovata vel semiobovata, plus minusve pruinosa glauca, nervis lateralibus saepius ramosis anastomosantibus reticulatis minute sinuosis. Planta glabra pruinosa et plus minusve glauca vel caesia. Ovaria ventre compresso orbiculari et nunquam rugoso.
106. *T. polycarpum.*

Practically, *T. polycarpum* Wats. is always glabrous while *T. Fendleri* Engelm. is always more or less pubescent, at least within the range of the former. Ovaries, fruits and under surface of upper leaves always show this character clearly. The fruits of these two species are endlessly variable. Some of these variations are more frequent in one part of the range, but they are liable to be found anywhere throughout the range and none of them is clearly cut from the other variations. However, three variations of *T. Fendleri* have a geographic range of their own and outnumber the intermediate forms.

102. T. Fendleri Engelm. ex Gray, Pl. Fendl. 5, 1849. *T. Fendleri,* var. *platycarpum* Trel., Proc. Bost. Soc. Nat. Hist. **23:** 304, 1886. *T. platycarpum* (Trel.) Greene, Pittonia, **1:** 166, 1888, nec. *T. platycarpum* Hook. f. & Th., Fl. Ind. **1:** 13, 1855. *T. hesperium* Greene, Pittonia, **2:** 24, 1889. *T. polycarpum*

Wats., var. *hesperium* (Greene) Jepson, Fl. W. Midd. Cal. 202, 1901. *T. omissum* Greene, Fedde, Rep. Sp. Nov. **7:** 254, 1909. *T. stipitatum* Rydberg, Fl. Rocky Mts., 290, 1918, nec *T. stipitatum* Rose, Contrib. U. S. Nat. Herb. **8:** 28, 1903. *T. Fendleri*, var. *hesperium* (Greene) Jepson, Fl. Calif. **1:** 530, 1921. *Planta* pubescens, raro subglabra vel glabra etiam, nunquam pruinosa nec caesia nec glauca, *caulis* tamen interdum purpurascens, 60–150 cm. *Radix* plus minusve stolonifera. *Sepala* erosa, floris maris ovata vel elliptica 3–5 mm. longa, foeminei ovata vel rhomboidea vel late lanceolata (1.0)–1.5–(2.0) mm. longa. *Filamenta* 4.0–7.5 mm. lutea. *Antherae* oblongae vel lineares, luteae, 2.2–3.4 mm., *acumine* 0.1–0.8 mm. *Stigma* 1.5–4.0 mm. *Ovaria* dense viridia, ventro ovato ad lanceolato, saepius densissime pubescente. *Carpella* matura haud reflexa, ovata ad lanceolata, viridia vel brunnea, plus minusve pubescentia vel interdum glabra, *stipite* (0.1)–0.5–(2.0) mm., ventre 2.7–9.0 mm. longo, 1.8–4.5 mm. lato, *nervis* lateralibus raro ramosis et sinuosis, nunquam minute sinuosis, nec anastomosantibus, nec reticulatis, nervo ventrali convexiore quam dorsali. Floret ab Aprili ad Septembrem.—Texas: *Ferris & Duncan 2569*, Jeff Davis Co., Davis Mts., Livermore Peak, July 9–12, 1921 (CA, M); *Havard 138*, Jeff Davis Co., Limpia Mts., July, 1883 (G); *Moore & Steyermark 3566*, Culbertson Co., Guadalupe Mountains, McKittrick Canyon, shaded rocky woodland, alt. 2000 m., July 22, 1931 (G, M). Wyoming: *Tweedy 4244*, Carbon Co., forks Battle Creek, alt. 7200 ft., Aug. 15, 1901 (US, type of *T. omissum;* NY, isotype); *A. Nelson 7660*, Albany Co., Tie City, in a cañon, July 20, 1900 (G); *Payson & Armstrong 3603*, Lincoln Co., Alpine, on the Snake River near the Idaho boundary, Wolf Creek, aspen groves, July 25, 1923 (G). Colorado: *Hall & Harbour 8*, lat. 39°–41°, 1862 (BC, G, M); *E. L. Greene 593*, Golden City &c., 1871 (G, paratype of *T. Fendleri*, var. *platycarpum*); *F. E. & S. S. Clements 243*, El Paso Co., Minnehaha, alt. 2600 m., 1 julii, 1901 (NY, type of *T. stipitatum;* G, isotypes); *Baker, Earle & Tracy 343*, Montezuma Co., W. La Plata Mts., Chicken Creek, common, alt. 9000 ft., July 6, 1898 (G); *Rollins 1808*, Las Animas Co., 26 miles northwest of Trinidad, 2 miles north of the Pergatore River, dry hillside, stems single, alt. 7500 ft., July 3, 1937 (G); *Churchill*, Clear Creek Co., Brookvale, Bear Creek Canyon, June 17, 1918 (G); *Hermann 5399*, Garfield Co., Trapper's Lake, n. shore, open spruce-fir grove, alt. 9500 ft., July 29, 1933 (G). Utah: *M. E. Jones 1194*, Salt Lake Co., Wahsatch Mts., Alta, alt. 10,000 ft., Aug. 5, 1879 (CA); *Goodman & Hitchcock 1391*, San Juan Co., Abajo Mts., n. slope, beside small stream, alt. 8500–11,000 ft., July 1–2, 1930 (CA); *E. B. & L. B. Payson 4883*, Summit Co., foothills of Uinta Mts., near Mill Creek, dry clay slope, alt. 8200 ft., July 4, 1926 (G, US);

McKelvey 4204, Washington Co., Zion Natl. Park, Zion Cañon, alt. 4000–5000 ft., May 7, 1934 (G). NEVADA: *Clokey 5462*, Clark Co., Lee Cañon, gravelly flat, with *Pinus scopulorum* and *Populus aurea*, alt. 2670 m., Aug. 1, 1935 (CA, G, UC); *M. E. Jones*, Humboldt Co., East Humboldt Mts., alt. 10,000 ft., Aug. 13, 1897 (UC); *P. B. Kennedy 1923*, Washoe Co., Hunter Creek, elev. 6000 ft., Aug. 2, 1912 (CA, G); *Baker 1323*, Ormsby Co., head of Fall Creek, alt. 2460 m., July 15, 1902 (G, NY). NEW MEXICO: *Standley 4257*, Pecos River National Forest, Windsor Creek, alt. ca. 8600 ft., July 8, 1908 (G, M); *Wright 1851* [Wright's mss.: *151*, Grant Co., hillsides of Coppermine Creek, 2–4 ft. tall, Aug. 4] (G, NY, US); *Metcalfe 248*, Socorro Co., Mogollon Mts., on Mogollon Creek, alt. ca. 8000 ft., July 17, 1903 (G, M, UC, C-UC); *Wooton 228*, Lincoln Co., White Mts., alt. 6300 ft., July 28, 1897 (M, UC); *Fendler 13*, 1847 [Fendler's mss.: 13, Santa Fe, Creek-valley, shady places, margin of irrigation ditches at the foot of perpendic. rocks, 13th June–1st July in flower, 19th July in fruit. Flowers dioecious] (G, TYPE and ISOTYPES of *T. Fendleri;* ANS, M, NY, ISOTYPES); *J. M. Bigelow 963*, San Antonita, Camp B, mt. arroyos, Oct. 9, 1853 (G, NY, US, paratypes of *T. Fendleri* var.? *polycarpum*). ARIZONA: *Blumer 3309*, Rincon Mountains, Spud Ranch, rocky places, alt. 2260 m., Aug. 23, 1909 (G, M, UC); *M. E. Jones 24,850*, Huachuca Mountains, Ramsay Cañon, Sept. 28, 1929 (CA, G, M, UC); *Eastwood 5652*, Grand Canyon of the Colorado River, June 15, 1916 (G); *Wolf 2450*, Gila Co., 10 miles northwest of Pine, July 1, 1928 (CA, G); *Goodman & Payson 2841*, Apache Co., Luka-Chukai Mountains, damp steep slope of forest floor, alt. 2727 m., June 30, 1936 (G, M); *M. E. Jones 3969*, Flagstaff, Aug. 4, 1884 (CA, UC). CALIFORNIA: *Heller 11,669*, Butte Co., Jonesville, Aug. 8, 1914 (CA, G); *Mrs. R. M. Austin 146*, Butte Co., Colby, July, 1896 (M, UC, US, paratypes of *T. fissum*); *S. B. & W. F. Parish 1483*, San Bernardino Mts., [San] Ber[nardino] Valley, Aug., 1882 (G, type of *T. Fendleri* var. *platycarpum;* US, isotype); *Greene 452*, high Sierra, in cold wet shade near snow, Oct. 14, 1874 (G, paratype of *T. Fendleri* var. *platycarpum*); *Kellogg & Harford 3*, Oakland Hills, March 1, June 6, 1868–1869 (G, paratype of *T. Fendleri* var. *platycarpum*); *Heller 6679*, Monterey Co., on the Salinas Road, near Del Monte, May 5, 1903 (G, M, UC, US); *Munz & Johnston 8696*, San Bernardino Co., 1 mile south of Oak Glen, alt. 4500 ft., July 17, 1924 (G); *Lemmon*, San Bernardino Co., woods near Grayback, July, 1879 (G, paratype of *T. Fendleri* var. *platycarpum*); *A. Gray*, Santa Barbara, Feb.–May, 1885 (G, paratype of *T. Fendleri* var. *platycarpum*); *Coulter* (G, US, paratypes of *T. Fendleri* var.? *polycarpum*). OREGON: *Cusick 2036a*, Eastern Oregon, 1898 (G); *Eastwood & Howell 1614*, Lane Co., McKenzie Highway, near Blue River,

Apr. 17, 1934 (CA); *Constance*, Lane Co., Eugene, Young's Grove, Apr. 12, 1924 (G); *Henderson 9057*, Harney Co., Stein Mts., above Fish Lake, in aspen woods, alt. 6500 ft., July 20, 1927 (CA); *M. E. Peck, 14,202*, Stein Mts., above Alberson, along stream, alt. 7000 ft., July 4, 1925 (ANS). Mexico, baja california: *Orcutt*, n. Lower Cal., Topo Cañon Mts., July 30, 1883 (F). Fig. 102, a–e.

Trelease did not authenticate every *Thalictrum* he saw at the Gray Herbarium where he prepared his monograph of the genus; only four herbarium sheets bear his identification. These are the specimens he cited as *T. venulosum.* On about half a dozen other sheets are to be found pockets containing a smaller pocket on which he briefly copied out the label of the specimen, probably in order to be able to replace those pockets where they belong after the drawings were made, for these pockets contain dissected fruits, presumably the very ones from which the illustrations of his monograph were drawn.

It seems that, at the Gray Herbarium, Dr. B. L. Robinson went over Trelease's work, wrote the new species-covers needed and pasted all the revision labels as Trelease would have done, for all the names written by Robinson on sheets or covers in the genus *Thalictrum* are in perfect accordance with Trelease's treatment of that genus. Nearly all of the *Thalictra* bearing a revision label in Robinson's handwriting were collected prior to 1886. Very few indeed of the specimens collected after that date were revised by Robinson. The later specimens were obviously not accessible to Trelease for his monograph. Furthermore, a few specimens might have been collected prior to 1886, but mounted and revised by Robinson only later on. These can not be distinguished from those Trelease had on hand in 1886, and they introduce some uncertainty as to the correspondence of Robinson's labels with Trelease's opinions in the genus. However, in the absence of any better criterion, the revision of the former has been considered as representing the opinion of the latter, provided the specimens were collected prior to 1886 in a locality within the range given by Trelease in his monograph of that year.

There is no authenticated specimen of *T. Fendleri*, var. *platycarpum* Trel. except for one specimen from the Smithsonian Institution which bears the following note in Trelease's handwriting: "*T. Fendleri v. platycarpum or nearly that*", but six

specimens at the Gray Herbarium bear a revision-label in Robinson's handwriting, stating that these are *T. Fendleri* Englm., var. *platycarpum* Trel. All six are from California and were collected in or before 1885. In view of this variety having been published in 1886 with California given as its range, it seems likely that these labels represent Trelease's opinion rather than Robinson's. The TYPE was selected from among these six specimens. It bears in a pocket a fruit dissected by Trelease and this apparently is the very fruit from which he made the drawing he published to illustrate *T. Fendleri* var. *platycarpum* in the paper where he published that variety. A drawing was made of this fruit (our fig. 102d) and one can not fail to note some similarity of pattern of this drawing to Trelease's drawing. Such sinuose lateral nerves are rather exceptional in *T. Fendleri.*

103. T. FENDLERI Engelm. var. WRIGHTII (Gray) Trel., Proc. Bost. Soc. Nat. Hist. **23:** 304, 1886. *T. Wrightii* Gray, Pl. Wright. **2:** 7 (269), 1853. *Planta* saepius glabra, omnibus partibus minor, haud stolonifera, (25)–50–(90) cm. *Stigma* ca. 1.5 mm. *Carpella* matura ovata ca. 2.5 mm. longa, *nervis* haud sinuosis, nervo dorsali convexo, ventrali convexiore quam dorsali. Nervus lateralis singulus, vel, si ternati, nervus medius conspicuor et multo crassior quam duobus aliis intermediis. Floret Augusto et interdum Julio vel Septembri.—ARIZONA: *M. E. Jones*, Santa Rita Mts., alt. 4500 ft., Aug. 24, 1903 (CA, UC); *Darrow & Arnold*, Santa Rita Mts., alt. 5500 ft., Aug. 23, 1936 (UC); *Harrison & Kearney 8907*, Santa Rita Mts., Aug. 20, 1932 (US). MEXICO, CHIHUAHUA: *Barlow*, Sierra Madre, ridge between Rio Chico and Rio Caballo, Sept. 30, 1911 (F); *Pennell 18,918*, Sierra Gazachic, Barranca Colorada, 35 km. southwest of Minaca, dry rocky ledges, herb, alt. 2200–2400 m., Sept. 16–17, 1934 (ANS); *LeSueur 1211*, Chuchichupa, Aug., 1936 (F); *Pringle 1131*, Potero Mts., alt. 7300 ft., Sept. 10, 1886 (G); *Hartman 788*, Pilares, "Culantrio", Sept. 19, 1891 (G); *Pringle 1180*, near Chihuahua, cool hillsides, Aug. 26, 1887 (ANS, F, G, NY, US). SONORA: *Hartman 121*, Los Pinitos, alt. 6100 ft., Oct. 12, 1890 (G, NY, US); *Wright 834*, mountain ravine at Santa Cruz, Sept., 1851 (G, TYPE; ANS, G, M, NY, UC, ISOTYPES); *Mearns 1605*, summit of San Jose Mts., Aug. 3, 1893 (US); *S. S. White 3081*, Cañon de las Estacas, July 30, 1940 (G). SINALOA: *Pennell 20,103*, Cerro de la Sandia, northeast of Panuco, Carrizo, along stream on pineland, alt. 1800–1900 m., Aug. 29–30, 1935 (ANS); *Gentry 6266*, Sierra Surotato, Ocurahui, Pine Forest area, steep moist shady canyon slope with mixed dominants, alt. 6000–7000 ft., Sept. 1–10, 1941 (ANS, M, NY). FIG. 103.

The number 834 in the manuscript of Wright is an *Artemisia*. But it is known that Gray changed Wright's collection-numbers. The manuscript of the latter enumerates three collections of *Thalictrum:*

178. *Thalictrum*, Cummings' Creek, May 10, 1849.[1]
151. *Thalictrum*, hillsides of Coppermine Creek, 2–4 ft. tall, Aug. 4, 1851.[2]
639. *Thalictrum*, Mountain ravines at Santa Cruz, Sept. 23, 1851.[3]

At the Gray Herbarium there are three herbarium sheets of Wright's collections. The labels read as follows (Gray's handwriting is in italics, the printed caption in roman):

First specimen:

debile, Buckley ?
Thalictrum (n. sp.)
debile, Buck
Texas, Mr. Charles Wright.

Second specimen:

No. *833* C. Wright, Coll. N. Mex. 1851.
Thalictrum Fendleri, Engelm.

Third specimen:

No. *834* C. Wright, Coll. N. Mex. 1851.
Thalictrum Wrightii n. sp.
Santa Cruz, Sonora.

Comparing these with what Gray published in Pl. Wright. **2:** 7 (269), 1853, it seems clear that these three specimens correspond respectively to Wright's field numbers 178, 151, 639.

104. T. Fendleri Engelm., var. **sinuosum,** var. nov. *Planta* similis praecedenti, fructubus tamen *nervis* sinuosis. Floret Augusti mense.—Mexico, chihuahua: *Goldman 125*, near Parral, alt. about 6500 ft., Sept. 20, 1898 (G, US). durango: *Pringle 13,701*, Sandia Station, Oct. 12, 1905 (G, US); *Pennell 18,443*, north of Cueva, Metates, ravine at waterfall, alt. 2600–2650 m., Aug. 29–30, 1934 (ANS); *Nelson 4749*, El Oro to Guanacevi, Aug. 14–16, 1898 (G, type and isotype: US, isotypes). san luis potosí: *Schaffner 26*, ex convalli San Luis Potosí, in sylvis montibus San Miguelito, 1876 (G). Fig. 104.

[1] According to a manuscript at the Gray Herbarium (Johnston, I. M., Field Notes of Charles Wright, 1940), this is in Fayette County, Texas.
[2] Eodem. Grant County, New Mexico.
[3] Eodem. Sonora, Mexico.

105. T. Fendleri Engelm., var. **quadrinervatum,** var. nov. *Planta* pubescens verosimiliter metrum superans. *Stigma* ca. 1.5 mm. *Carpella* matura ventro ca. 5 mm. longo et ca. 2.5 mm. lato, *nervis* rectis vel sinuosis, ventrali convexiore quam dorsali. Nervi laterales carpelli vel tres vel singulus in utroque latere. Si tres, intermedius quam duo alii multo conspicuor et crassior est. *Flores* ignoti.—Mexico, baja california: *Wiggins & Demaree 4941*, Sierra San Pedro Martir, La Encantada, margins of meadow and adjacent slopes, alt. 2200 m., Sept. 20, 1930 (G, type; F, NY, UC, US, isotypes). Fig. 105.

106. T. polycarpum (Torr.) Watson, Proc. Am. Acad. **14:** 288, 1879, nec *T. polycarpum* Loret, Bull. Soc. Bot. Fr. **6:** 16, 1859, ut nomen provisorium alternativumque editum. *T. Fendleri* Engelm., var.? *polycarpum* Torr., Pac. R. R. Rep. **4:** 5 (61), 1857. *T. caesium* Greene, Fl. Franc. **3:** 309, 1892, nec *T. caesium* Blocki, Oest. Bot. Zeitschr. **37:** 286, 1888. *T. bernardinum* Greene, Fedde, Rep. Nov. Sp. **7:** 252, 1909. *T. campylopodum* Greene, l. c. 253, 1909. *T. coreospermum* Greene, l. c. 1909. *T. lentiginosum* Greene, l. c. 1909. *T. papyraceum* Greene, l. c. 1909. *T. ametrum* Greene, Muhlenbergia, **5:** 129, 1909. *T. latiusculum* Greene, l. c. 130, 1909. *T. magarum* Greene, l. c. 1909. *T. mendocinum* Greene, l. c. 129, 1909. *T. leiocarpum* Greene, l. c. 130, 1909, sicut nomen provisorium et alternativum praecedenti editum, nec *T. leiocarpum* Fries, Linnaea, **29:** 731, 1857 sive 1858. *T. polycarpum* Wats. var. *caesium* (Greene) Jepson, Fl. Calif. **1:** 530, 1921. *Planta* stolonifera omnino glabra, saepissime cauli, ramis, ramulis, fructubusque pruinosis vel glaucis vel caesiis, 50–150 cm. *Sepala* floris maris elliptica 3–5 mm. longa, foeminei orbicularia vel ovata vel saepius late ovata 1.0–2.5 mm. longa. *Filamenta* 5–6 mm. Antherae 2–4 mm., *acumine* 0.1–0.5 mm. *Stigma* 1.5–4.0 mm., filiforme. *Carpella* matura reflexa et valde compressa, nunquam costata, *stipite* (0.1)–0.2–(1.0) mm., ventre oborbiculari vel obovato-lanceolato vel saepius obovato 4–6–(8) mm. longo et (2.2)–3.5–(4.5) mm. lato, *nervis* lateralibus valde sinuosis ramosis anastomosantibusque, nervo ventrali interdum gibboso et semper quam dorsali convexiore. Floret Martio Aprili Majo et Junio.—California: *Chesnut 33*, Mendocino Co., Round Valley, alt. 440 m., May 20–June 20, 1898 (US, type of *T. mendocinum*); *Hasse*, Los Angeles, cañons, copses, Apr. 7–May 20, 1892 (US, type of *T. lentiginosum;* NY, isotype); *Heller 5855*, Lake Co., foothills of Mt. Sanhedrin, midway between Potter Valley and Hullville, July 14, 1902 (US, type of *T. latiusculum;* ANS, F, G, M, NY, isotypes); *S. B. Parish 3469*, San Bernardino Co., San Bernardino Mountains, Waterman Cañon, alt. 2000 ft., June 29, 1894 (US, type of *T. bernardinum;* M, isotype); *Orcutt*, Cuyamaca Mts., July, 1889 (US, type of *T.*

coreospermum); *Alderson*, San Diego Co., Witch Creek, April, 1894 (G-ND, type of *T. magarum;* G, photo of type); *Greene*, Chico, June, 1889 (G-ND, type of *T. caesium;* G, photograph of the type; UC, NY, isotypes); *L. E. Smith 306*, Shasta Co., Pitt River, May 28, 1913 (CA); *Bidwell*, Chico, Apr., 1879 (G); idem, May, 1878 (G); *Mrs. R. M. Austin*, Plumas Co., 1877 (G); *G. R. Vasey*, Sancelito, 1876 (G) [These last four specimens were authenticated by Watson]; *J. M. Bigelow*, Napa Valley, 1853–1854 (G, TYPE of *T. Fendleri* var.? *polycarpum;* NY, ISOTYPE). OREGON: *J. Howell*, Tualitin Plains, damp shady woods, along creek, July, 1877 (G); *J. Howell*, Sauvie's Island, July 1877 (F, type of *T. papyraceum*); *T. Howell*, along wooded streams, June 1881 (ANS, F, isotypes of *T. campylopodum*); *J. C. Nelson 1113*, Polk Co., W. Salem, woods near river, May 8, 1817 (G); *Eastwood & Howell 1487*, Douglas Co., 4 miles n. of Oakland, Apr. 13, 1934 (CA); *J. C. Nelson 2701*, Marion Co., State School, low ground, June 21, 1919 (G); *T. Howell*, Washington Co., by creeks, May, 1880 (F); idem, May, 1881 (ANS). FIG. 106, a–c.

The validity of *T. polycarpum* Wats. against the earlier *T. polycarpum* Loret has been argued pro and con many times. First, Greene noticed that there were two species called *T. polycarpum* and proposed the name *T. ametrum* to supersede *T. polycarpum* Wats. See Muhlenbergia, **5:** 129, 1909.

Second, L. C. Wheeler pointed out that *T. polycarpum* Loret, being a "nomen provisorium", was not validly published and thus could not invalidate a later homonym. Hence *T. polycarpum* Wats. was the correct name for the plant discussed. See RHODORA, **40:** 319, 1938. Third, Leon Croizat in Madroño, **7:** 1, 1943, in an article which I find much harder to follow through than Loret's "stiff french", contested the following points: 1, that it has not been made clear yet which of Loret's names, *T. polycarpum* and *T. multiflorum*, is a "nomen provisorium". 2, that *T. polycarpum* Loret was published as a synonym of *T. multiflorum* Loret, hence it is invalid (Amsterdam Code, Art. 40). 3, that *T. polycarpum* Loret is illegitimate, invalid, has been treated as a synonym on taxonomic grounds, and is an earlier homonym. Thus, according to Article 61, it renders illegitimate *T. polycarpum* Wats.

To this one may answer: 1, that both *T. multiflorum* Loret and *T. polycarpum* Loret are "nomina provisoria". If not, what is the meaning of "nomen provisorium"? There does not exist yet any officially published definition of that term, but in the

meantime we will take it in its common, everyday sense, hoping that it will not turn out that the 1935 International Congress had some esoteric meaning in mind. 2, that *T. polycarpum* Loret was not published as a synonym of *T. multiflorum* Loret, but as a "nomen alternativum". As ruled by the 1935 Congress, when names are published as "nomina alternativa" that does not render them invalid, but they are invalid if published as "nomina provisoria". Hence both *T. polycarpum* Loret and *T. multiflorum* Loret are not validly published. See Journ. Bot. **74:** 75, 1936. 3, that Article 61 mentions 4 conditions as necessary, that a homonym might be invalidated by another homonym, namely, that a homonym must be "*previously* and *validly* published for a group of the *same rank* based on a *different type* [italics mine]". *T. polycarpum* Loret does not fulfill the second of those conditions. Hence it cannot render *T. polycarpum* Wats. illegitimate. Article 61 speaks of "illegitimate names" and of names "treated as synonyms on taxonomic ground" only to specify that those two qualities are of no effect in the solution of the problem.

4 and 5, Cronquist and Weatherby, in two different articles published on the same page, both pointed out that "nomina provisoria" have been ruled out as not being validly published, and that the other half of Article 61, cited by Croizat, explicitly states that an earlier homonym must have been validly published in order to invalidate a later homonym. Now, Croizat himself admits that *T. polycarpum* Loret was not validly published, hence there is no reason why we should not keep *T. polycarpum* Wats. (Madroño, **7:** 83, 1943).

The type of *T. Fendleri* Engelm., var. ? *polycarpum* Torr., is evidently not at New York, but at the Gray Herbarium. The text of the original description suggests that Coulter's plant should not be selected as a type. It is represented by two sheets, one at the Gray, the other at the National Herbarium, and both were originally labelled *T. dioicum* L. in John Ball's handwriting. The specimen at the Gray bears the following successive annotations in Gray's handwriting:

T. Fendleri
= *T. polycarpum* Torr. = *Fendleri* var.
T. polycarpum

Both specimens are densely pubescent individuals of *T. Fendleri* and they agree only in part with the original description of *T. Fendleri*, var. ? *polycarpum* Torr.

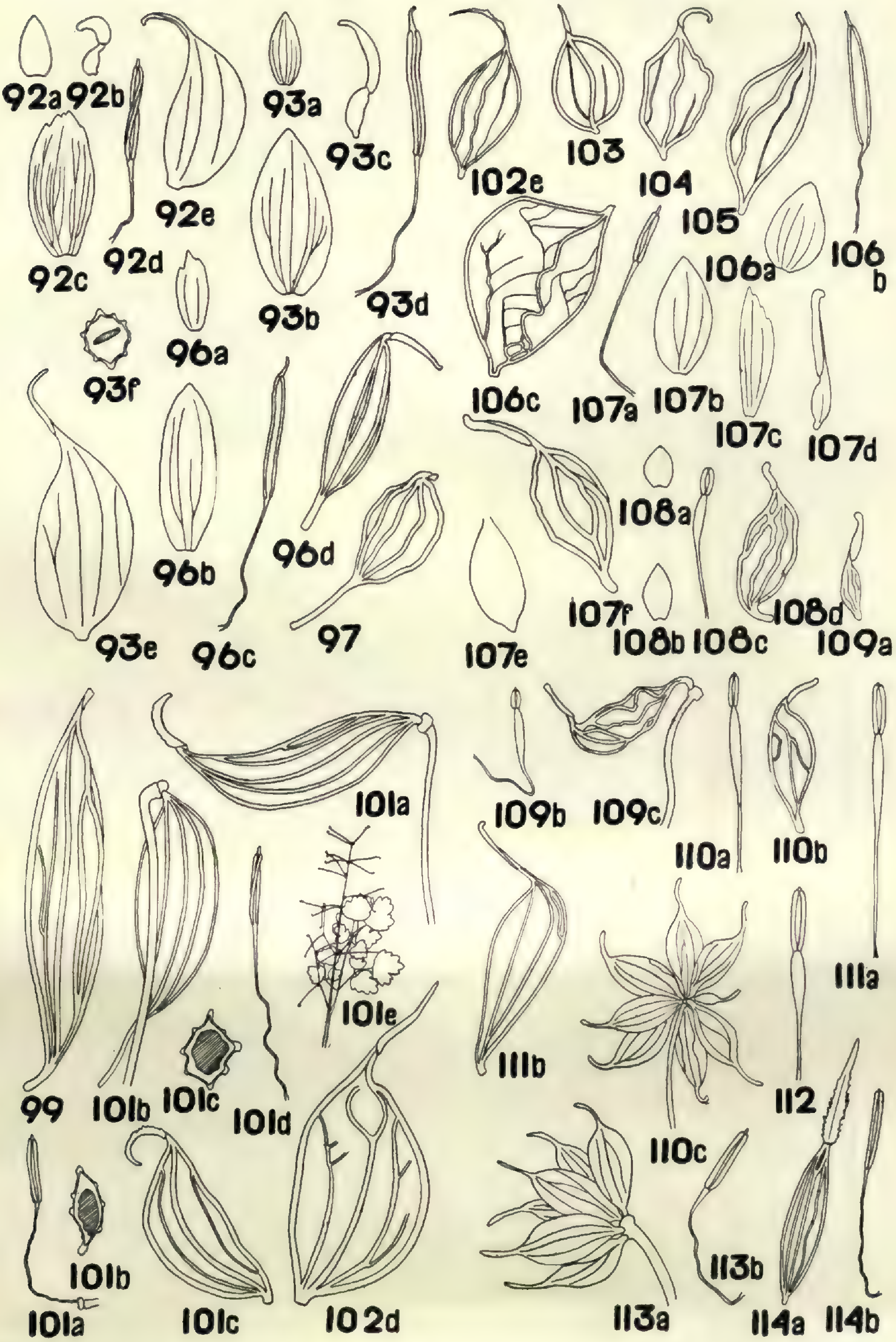
J. M. Bigelow's collection from San Antonita, New Mexico, is represented at the Gray Herbarium, at the New York Botanical Garden and at the Smithsonian Institution. All three are good ordinary *T. Fendleri* with a large, open and compound panicle and with pubescent fruits and leaflets. Although cited by Torrey, this collection does not agree at all with his description. The specimen at New York is labelled *Thalictrum Fendleri* Engelm. in Gray's handwriting and so is the specimen at the Gray Herbarium, but to this one Gray himself added later *fere var. Wrightii.* The third specimen is labelled *Thalictrum Fendleri* Engelm. in *Torrey's* handwriting. The New York sheet has the original label: *Camp B, San Antonita, Octo. 9, 1853, 963 Thalictrum sp., mt arroyos, JMB.*

At the Smithsonian Institution there is also a specimen of *T. polycarpum* which was first labelled *Thalictrum dioicum L. ?*, but Torrey changed it later to *polycarpum.* It was collected by E. Samuels in Sonoma Co., California. Although authenticated and agreeing with the original description, this specimen was not cited.

J. M. Bigelow's collection in Napa Valley is represented both at the Gray Herbarium and at the New York Botanical Garden. The New York specimen is identified *Thalictrum Fendleri* Engelm. in Torrey's handwriting. It is an immature pistillate plant. The label of the specimen at the Gray Herbarium reads as follows:

> *T. Fendleri. var.*
> **Thalictrum polycarpum**
> *Napa Valley Calif.* **n. sp. Torr.**
> Bigelow

Gray's handwriting is indicated by italics, Torrey's by boldface characters. This latter specimen is made up of a staminate inflorescence and a complete pistillate specimen with immature fruits. This Bigelow collection is very clearly *T. polycarpum* (Torr.) Wats. and agrees perfectly well with the original description of *T. Fendleri* Engelm. var.? *polycarpum* Torr. The specimen to be selected as a TYPE is evidently J. M. Bigelow's specimen at the Gray Herbarium, from the Napa Valley collection.



Details of Flowers or Fruits of Thalictrum, all × 4; except 101e, × 1/5, and 110c and 113a, these × 3.

(For explanation see end of paper.)

It is the only specimen which is at the same time cited, authenticated and agreeing well with the original description. It is also the most complete specimen and a well preserved one. This problem had already been outlined by L. C. Wheeler in RHODORA, **40:** 319, 1938, but no definite conclusion was given.

When Watson published his *T. polycarpum* he gave *T. Fendleri*, var.? *polycarpum* as a synonym "in part", without specifying which of Torrey's specimens were included. But the description of Watson eliminates both Coulter's and J. M. Bigelow's New Mexican collections; only the Napa Valley specimen agrees with the description. Thus *T. polycarpum* must be considered as a new status for *T. Fendleri* Engelm. var. ? *polycarpum* Torr. "in part *including the type specimen*" and there is no need to select a new type for *T. polycarpum*, but we must write *T. polycarpum* (Torr.) Wats.

L. C. Wheeler has expressed a different opinion in RHODORA, **40:** 317, 1938. To him it is not clear what of Torrey's variety WATSON included in his species. He thus naturally comes to the conclusion that one must write *T. polycarpum* Wats. and must select the type of that species independently from the type of Torrey's variety. To this we may say that Torrey's variety included two different species but his and Watson's descriptions agree well only with the Napa Valley collection. Watson had all three syntypes at hand and could easily settle that point.

Anyhow, there are at the Gray Herbarium 5 collections of *T. polycarpum* (Torr.) Watson authenticated by Watson himself. All agree well with the description, are within the range given, and were collected from 1876 to 1879. As a matter of fact, all 5 labels are entirely in Watson's handwriting. If one should follow Wheeler's opinion, one of those 5 specimens should be taken as the type. There is ample choice: one specimen is made up of 2 staminate inflorescences, another of a pistillate inflorescence, a third one of two pistillate and one staminate inflorescence, a fourth is the upper half of a plant with fully mature fruits, and the fifth one, the best specimen, a nearly complete plant with also fully mature fruits. The latter is the only specimen cited by Watson. Its label reads as follows:

Thalictrum polycarpum
(*T. Fendleri*, var. *polycarpum*, Torr.)

Damp shady woods along creeks,
near Tualitin Plains, Oregon.
J. Howell, July 1877.

Oddly enough, Wheeler selected J. M. Bigelow's Napa Valley collection as the type of *T. polycarpum,* the very type of *T. Fendleri* Engelm. var. ? *polycarpum* Torr. I see no reason to write *T. polycarpum* Wats. rather than *T. polycarpum* (Torr.) Wats., if the type of both units is the same specimen.

Sectio **Leucocoma** (Greene), stat. nov. Subg. or Sect. *Leucocoma* Greene, Leaflets, **2:** 54 and 55, 1910, subdivisio subgenerica cui deest determinator ordinis. *Leucocoma* (Greene) Nieuwland, Am. Midl. Nat. **3:** 254, 1914, ut genus, nec *Leucocoma* Rydb. Fl. Rocky Mts. 108, 1917. *Plantae* haud stoloniferae, sed *radicibus* fibrosis et numerosis. *Flores* polygami, sexu variabiles modo mirabili. *Sepala* erosa maris majora. *Filamenta* alba in nonnullis clavata. *Antherae* fere ovoideae ad oblongo-lineares, pallido-fuscae, *apice* truncatae vel *acumine* brevi. *Stigma* breve plus minusve bialatum. *Carpella* pariete membranacea, paullum si vero compressa, sed *nervis* rugosissimis saepius simplicibus et ternatis in latere. Species typica *T. canadense* sensu Greene i. e. *T. polygamum* Muhl. sensu auctoris sit.

This section is represented from Labrador to British Columbia and also in Newfoundland, Saint-Pierre et Miquelon and in the United States except in Mississippi, California, Utah and Nevada.

A key to the species of the section is not a workable one if it takes into account the full variation of each species. With more than a thousand herbarium sheets at hand one finds that occasional specimens will agree with the species to which they belong but for one character. To take such specimens into account would render the description so full of *perhaps, sometimes, rarely, or, even,* that they would not be descriptions any more. The following keys and descriptions are built upon specimens which I consider typical.

Clavis ad flores masculos ferentia

a. Pubescentia pilorum capitatorum vel rarissime deest; antherae 1.6–2.8 mm.; foliolae coriaceae et margine plus minusve revoluto . . . . 107. *T. revolutum.*
a. Pubescentia vel deest vel pilorum uniseriatorum . . . . *b.*
b. Antherae 0.5–1.4 mm.; filamenta apice dilatata sub antheris constricta . . . . *c.*

c. Foliolae minores saepe integrae 0.5–1.5 cm. longae. Plantae glabrae. Filamenta 3.0–5.0 mm. . . . *d.*
d. Filamenta rigida. Planta rigida . . . . 108. *T. macrostylum.*
d. Filamenta debilia. Planta reclinans . . . . 109. *T. subrotundum.*
c. Foliolae fere omnes apice trilobatae 1.5–4.0 cm. longae. Plantae saepius pubescentes. Filamenta 3.5–8.0 mm. . . . . *e.*
e. Antherae ca. 1 mm.; pedunculi gracillimi. Inflorescentia paniculata. Filamenta 3.5–5.0 mm. . 110. *T. polygamum.*
e. Antherae ca. 1.2 mm.; pedunculi crassiusculi; filamenta 5.0–8.0 mm.; inflorescentia subcorymbosa 111. *T. polygamum*, var. *hebecarpum*
b. Antherae 1.5–3.2 mm. . . . *f.*
f. Antherae 1.5–2.5 mm. Plantae pubescentes . . . *g.*
g. Antherae 1.5–2.0 mm. Inflorescentia apice rotunda. 112. *T. polygamum*, var. *intermedium.*
g. Antherae 1.8–2.2 mm. Planta fastigiata foliolis coriaceis et margine revoluto. Inflorescentia apice acuta . . . . 113. *T. dasycarpum.*
f. Antherae 2.2–3.2 mm. Plantae nonnunquam glabrae 114. *T. dasycarpum*, var. *hypoglaucum.*

Clavis ad flores foemineas ferentia

a. Foliolae glabrae saepe integrae 0.5–1.5 cm. longae . . . *b.*
b. Stigma (0.7–) 1.0 (–1.5) mm. Foliolae interdum integrae, saepius apice trilobatae, saepius coriaceae . . . . . . 108. *T. macrostylum.*
b. Stigma 1.0–2.0 mm. Foliolae fere omnes integrae, saepius membranaceae . . . . 109. *T. subrotundum.*
a. Foliolae ca. 2.5 cm. et saepius inferne pubescentes . . . *c.*
c. Foliolae inferne sicut carpella dense pubescentes pilis capitatis. Foliolae coriaceae margine revolutae . . 107. *T. revolutum.*
c. Pubescentia, si adest, pilorum uniseriatorum . . . *d.*
d. Inflorescentia paniculata apice acuta . . . *e.*
e. Foliolae coriaceae pubescentes. Stigma 2–3 mm. 113. *T. dasycarpum.*
e. Foliolae saepius membranaceae. Stigma 2.5–5.0 mm. 114. *T. dasycarpum*, var. *hypoglaucum.*
d. Inflorescentia apice rotunda vel subcorymbosa . . . *f.*
f. Inflorescentia subcorymbosa, pedunculis crassiusculis 111. *T. polygamum*, var. *hebecarpum.*
f. Inflorescentia paniculata . . . . 110. *T. polygamum.*
112. *T. polygamum*, var. *intermedium.*

Clavis ad fructus ferentia

a. Carpella omnia valde stipitata, reflexa et nervis valde sinuosis. Foliolae 0.5–1.5 cm. longae, glabrae et integrae. Stigma ca. 1.5 mm. . . . . 109. *T. subrotundum.*
a. Carpella nulla reflexa, vel alia reflexa, alia radiata, alia ascendentia . . . *b.*
b. Carpella omnia ascendentia. Receptaculum ad basem capitis fructuum . . . *c.*
c. Carpella apice acuminata et incurvata nervis valde sinuosis; stigma ca. 1.0 mm.; foliolae glabrae, inferne albicantes, ca. 1 cm. longae . . . . 108. *T. macrostylum.*
c. Stigma 2–3 mm. Plantae dense pubescentes et foliolis ca. 2.5 cm. longis . . . . 113. *T. dasycarpum.*
b. Receptaculum ad centrum capitis fructuum. Carpella recta . . . *d.*

d. Pubescentia pilorum rigidorum capitatorum, rarissime deest. Foliolae coriaceae margine valde revoluto
107. *T. revolutum.*

d. Pubescentia saepius adest pilorum flexuosorum et uniseriatorum. Foliolae saepius membranaceae....*e.*

e. Inflorescentia subcorymbosa pedunculis crassiusculis. Carpella ventre saepius oblanceolato
111. *T. polygamum*, var. *hebecarpum.*

e. Inflorescentia paniculata....*f.*

f. Venter carpelli saepius lanceolatum, nervo ventrali convexiore quam dorsali
114. *T. dasycarpum*, var. *hypoglaucum.*

f. Venter carpelli ovatum vel obovatum vel ellipsoideum vel lanceolatum, stipite 0.2–0.5 (–1.0) mm.
110. *T. polygamum.*
112. *T. polygamum*, var. *intermedium.*

107. T. REVOLUTUM DC. Syst. **1:** 173, 1817, nec *T. revolutum* Lievre, Oestr. Bot. Zeitschr. **23:** 254, 1873. *T. revolutum* DC., var. β *subglabrum* DC. Syst. **1:** 178, 1817. *T. purpurascens*, var. *ceriferum* Austin ex Gray, Man. Bot., ed. **5:** 39, 1867. *T. aristatum* Willd. ex Lec., Bull. Soc. Bot. Belg. **24:** 253, 1885, nomen. *T. graveolens* Muhl. ex Trel., Proc. Bost. Soc. Nat. Hist. **23:** 301, 1886, ex synonymis. *T. Cornuti* L., var. *macrostylum* Shuttlw. in Small & Heller, Mem. Torr. Bot. Club, **3:** 8, 1892, ut synonymon editum. *T. Cornuti* L., var. *brevifolium* Rugel in Small & Heller, l. c. 9, 1892, nomen ut synonymon editum nec *T. Cornuti* L., var. *brevifolium* Shuttlw. in Gray, Syn. Fl. North Am. **1,** part 1: 17, 1895. *T. amabile* Greene, Am. Midl. Nat. **2:** 294, 1912. *T. revolutum* DC., f. *glabra* [sic] Pennell, Bartonia, **12:** 12, 1931. *Planta* circa metralis, fere semper pubescens per foliolas inferne, sepala, pedunculos et ovaria. Aliter semper glabra. *Foliolae* coriaceae margine valde revoluto, saepius obovatae, *apice* trilobatae, *lobis* saepius rotundis. *Sepala* ovata vel oblanceolata 3–4 mm. longa, floris foeminei 2.0–3.5 mm. longa. *Filamenta* debilia paululum apice incrassata, sub antheris haud constricta interdum subclavata, 4.5–5.5 mm. *Antherae* oblongo-lanceolatae ad oblongo-lineares 1.7–2.8 mm., *acumine* 0.2–0.5 mm. *Stigma* 2.0–3.5 mm. alis saepius conspicuis et pilis minutissimis, in fructu saepius incurvatum. *Carpella* matura *stipite* 0.2–0.5 mm., ventre ellipsoideo ad lanceolato. *Receptaculum* ad centrum capitis fructuum. Floret ad meridiem Majo, sed ad Septentrionem et in montibus floret Junio vel interdum Julio.—QUEBEC: *J. Macoun 72,578*, Gaspé Co., Percé, Aug. 30, 1907 (C, G). MASSACHUSETTS: *Fernald & Weatherby 16,807*, Barnstable Co., Falmouth, roadsides in woods north of Wood's Hole, Sept. 20, 1918 (NE); *Rich*, Middlesex Co., Stoneham, rocky woods, June 18, 1894 (NE); *W. Boott*, south end of Mystic Pond, wood, July 4, 1869 (G); *Pease 3782*, Essex Co., N. Andover, Boston Hill, dry pastures, June 28, 1904 (NE). RHODE ISLAND: *J. F. Collins*, Providence, n. of Cat Swamp, June 26, 1892 (G);

Lownes & Collins, Washington Co., South Kingston, July 11, 1930 (NE); *Fernald 9518*, Providence Co., Lincoln, Wilbur Crossing, dry thicket, July 17, 1913 (NE). Connecticut: *Weatherby 6779*, Tolland Co., Somers, roadside thicket, June 22, 1935 (NE); *Bissell 54*, Hartford Co., Southington, dry rocky ground, frequent, June 15, July 10, July 30, 1893 (NE); *Woodward*, Franklin, dry bank, June 24, 1911 (G). New York: *Muhlenberg 795* (ANS); *Eames, Randolph & Wiegand 12,062*, Ontario Co., Phelps-Waterloo townline, Sept. 6, 1919 (G); *Burnham*, Warren Co., Lake George village, Sept. 3, 1897 (G); *House 25,018*, Albany Co., so. of Kamer, sand plains, Aug. 24, 1937 (NY). New Jersey: *Austin*, Closter, June 5–15 (G, type of *T. purpurascens* var. *ceriferum*); *Austin*, Closter, 1866 (G, paratype of *T. purpurascens* var. *ceriferum*); *Austin*, Ne. New Jersey, uplands (G, paratype of *T. purpurascens* var. *ceriferum*); *Austin*, Palisades, 1858 (G, F); *Austin*, Closter, June, 1865 (F, paratype of *T. purpurascens* var. *ceriferum*). Pennsylvania: *Pennell 8956*, Chester Co., Nottingham, serpentine barren, Sept. 14, 1916 (ANS, paratype of *T. revolutum*, f. *glabrum*); *Small*, Perry Co., vicinity of Marysville, June 25, 1888 (F); *Schweinitz*, Bethlehem (ANS); *Meredith*, Bucks Co., 1½ miles west of Union School House, open hedge-row, May 30, 1921 (G); *Muhlenberg 598* (Willdenow Herb., paratype of *T. polygamum* ?) Delaware: *Commons*, near Centreville, banks of streams, July 5, 1872 (ANS). Maryland: *J. D. Smith*, Garrett Co., Oakland, copses, borders of glades, July 13, 1883 (G). District of Columbia: *Steele*, Chain Bridge flats, July 4, 1904 (US); *L. F. Ward*, June 23, 1878 (F, NY). West Virginia: *Millspaugh 336*, 1890–1899 (F); *Gilbert 482*, Cabell Co., Pleasant Valley, open oak woods, July 8, 1936 (G, NY); *Core*, Monongalia Co., near Halleck, July 11, 1931 (G). Virginia: *Fernald & Long 11,835*, Greensville Co., Emporia, rich deciduous wooded slope, May 11, 1940 (G); *Small*, Smyth Co., Walker Mountains, Shannon Gap, alt. 3000 ft., June 20, 1892 (F, G, M); *Churchill*, Rockbridge Co., Glasgow, June 1, 1891 (M). North Carolina: *Small & Heller 264*, on the road between Blowing Rock and Shull's Mill, June 16–17, 1891 (ANS, F, M, NY, US); *Churchill*, Polk Co., Tryon, open hillsides, May 22, 1899 (M); *Churchill*, Madison Co., Hot Springs, June 1, 1899 (M). South Carolina: Saint Andrews, May, 1855 (G); *B. E. Smith*, Darlington Co., Lauther's Lake, low land, Aug. 3, 1940 (NC); *House 2225*, Oconee Co., Fort Hill, May 24, 1906 (BG, M, US). Georgia: *Leeds 2013*, Lumpkin Co., Blood Mt., Flatrock Gap, moist edge of exposed rock slide, June 2, 1934 (ANS); *Cuthbert 516 & 551*, Augusta, May 17, June 18, 1901 (NY); *Pollard & Maxon 521*, Dougherty Co., vicinity of Albany, Aug. 13, 1900 (G, US); *Churchill*, Chickamauga Park, near Lookout Mountain, May 8, 1906 (G, M); *Green*, Macon

(ANS, labelled *T. Cornuti*, var. *brevifolium* Rugel and paratype of *T. macrostylum*). FLORIDA: *Chapman* (G, NY); *Rugel*, prope St. Marks, inter frutices (Magnolia-Chamaerops), jun. 1843 (NY, labelled *T. Cornuti* var. *macrostylum* and paratype of *T. macrostylum*). ONTARIO: *J. Macoun 23,615*, Amherstburg, July 31, 1901 (G). OHIO: *Wilkinson 228*, Mansfield, waste places, June, Aug., 1895 (US, type of *T. amabile*); *Moseley*, Erie Co., Perkins, July 8, 1895 (G); *Lea*, Hamilton Co., June 14, 1838 (ANS). INDIANA: *Peattie*, Porter Co., Tremont, sandy field and along roads in the dunes, Sept. 4, 1920 (G). KENTUCKY: *Smith & Hodgdon 3865*, Monticello, Beaver Creek, rich wooded slopes, July 12–14, 1937 (G); *Short*, Lexington (ANS); *McFarland & James 5*, Whitley Co., 3 miles west of Corbin, low swampy field near edge of ditch, July 25, 1941 (M). TENNESSEE: *Ruth 1803*, Knoxville, groves and open woods, June, 1897 (NC, NY); *Svenson 10,564*, Cheatham Co., Pegram, dry shale, Aug. 22, 1940 (BG); *Eggert*, Dickson Co., near White Bluff, Aug. 19, 1897 (M). ALABAMA: *Eggert*, De Kalb, Collinsville, June 29, 1897 (M). ILLINOIS: *Gleason 9131*, Champaign Co., Champaign, wet prairie along railway, July 3, 1940 (NY); *Gleason*, Urbana, wet woods, June 27, 1906 (G); *Greenman 3683*, vicinity of Chicago, June 15, 1911 (G). MISSOURI: *Standley 9802*, Webster Co., vicinity of Rogersville, thin woods, Sept. 3, 1912 (US); *Letterman*, near Allenton, 1893 (ANS, M, US); *Emig 268*, Elmont, May 23, 1914 (M). FIG. 107, a–f.

The specimen from Percé is only tentatively identified as *T. revolutum*. It is from far out of range and in a very different floristic area.

The correct name for this species is still unsettled. Two nomina dubia antedate *T. revolutum* and when better understood might replace it: *T. purpurascens* L. and *T. pubescens* Pursh.

108. T. MACROSTYLUM Small & Heller, Mem. Torr. Bot. Club, **3:** 8, 1892. *T. Cornuti* L., var. *brevifolium* Shuttleworth in Gray, Syn. Fl. North Am. **1,** part 1: 17, 1895, nomen nudum, nec *T. Cornuti* L., var. *brevifolium* Rugel in Small & Heller, Mem. Torr. Bot. Club, **3:** 8, 1892. *T. polygamum* Muhl., var. *macrostylum* (Small & Heller) Robinson in Gray, Syn. Fl. North Am. **1,** part 1: 17, 1895. *Planta* omnino glabra circa metralis. *Foliolae* saepius coriaceae, obovatae vel oblongae, interdum integrae, saepius apice trilobatae, infernae nonnunquam fere albae, 0.7–1.5 cm. longae. *Inflorescentia* maris conferta et subcorymbosa. Inflorescentia foeminea variabilis. *Sepala* floris masculi 1.5–2.0 mm., foeminei ca. 1 mm. *Filamenta* 3–4 mm., rigida, paullo clavata et sub antheris constricta. *Antherae* 0.5–1.2 mm., oblongae vel oblongo-lanceolatae, *acumine* brevissimo. *Stigma*

(0.7)–1.0–(1.5) mm., alis obscuris. *Carpella* matura haud compressa, nec costata, abrupte stipitata et apice incurvato, *stipite* ca. 0.5 mm., ventro ca. 3 mm. longo et 1.5 mm. lato, *nervis* rugosissimis et nonnunquam sinuosis. *Receptaculum* ad basem capitis fructuum. Floret Junio, Julio et Augusto.—VIRGINIA: *Fernald & Long 9050*, Henrico Co., west of Elko Station, sphagnous springy swales bordering Whiteoak Swamp, Aug. 17, 1938 (G); idem *8711*, July 23, 1938 (G, M); idem *8710* (G); *Fernald, Long & Smart 5778*, on headwaters of Blackwater River, about 3 miles southeast of Petersburg, swampy woods, June 25, 1936 (G); *L. F. & F. R. Randolph 520*, Princess Anne Co., Pungo, open swampy land along West Neck Creek, June 29, 1922 (G). NORTH CAROLINA: *Small & Heller*, Catawba Co., n. of Hickory, swamp, June 25–26, 1891 (NY, TYPE and ISOTYPES of *T. macrostylum;* F, ISOTYPES); idem *428* (ANS, NY); *Rugel*, Swanano, in pratis vallis, Aug., 1841 (G, *T. Cornuti* var. *brevifolium*); *Heller 1015*, Catawba Co., near Hickory, June 23, 1893 (ANS, F, G, M, NY, US); *Biltmore Herbarium 11,024*, Flat Rock, low grounds, June 6, 1905 (NY, US); *Wiegand & Manning 1216*, Martin Co., June 21, 1927 (G); *Godfrey 4384*, Beaufort Co., Washington, marsh, June 9, 1938 (G); *Godfrey 4375*, Hyde Co., Swanquarter, June 9, 1938 (G); *Godfrey 4449*, Cartaret Co., Newport, marsh, June 10, 1938 (G); *House 4318*, Pisgah Forest, alt. 2500 ft., June 29, 1909 (US); *Peattie 1317*, Polk Co., The Shoals, low wet woods, Aug. 20, 1921 (F); *Peattie 1313 & 1313A*, Polk Co., east of Columbus, edge of a *Magnolia virginica* swamp, Aug. 20, 1921 (NC).

The two herbarium sheets on which Small and Heller picked up the two synonyms given in the original description belong to *T. revolutum* DC.

109. T. **subrotundum,** sp. nov. *Planta* omnino glabra, 1–2 m. alta, nonnunquam debilis ut in proximis innixa est. *Foliolae* integrae membranaceae, interdum coriaceae, orbiculares vel ovatae vel obovatae vel ellipticae interdum lanceolatae, 0.5–1.5 cm. longae. *Inflorescentia* paniculata et plus minusve foliosa. *Filamenta* debilia 3.5–5.0 mm., paullulum apice clavata et sub antheris constricta. *Antherae* ca. 0.75 mm. *Stigma* 1–2 mm., in fructu inflexum. *Carpella* matura conspicue reflexa, *stipite* ca. 1 mm., ventre obovato, *nervis* sinuosissimis et gibbosis. Floret Junio.—SOUTH CAROLINA: *Gibbes*, Georgetown, Apr., 1857 (NY); *Gibbes*, Summerville, May 25, 1855 (NY); *Godfrey & Tryon 1401*, Berkeley Co., 8 miles southwest of Moncks Corners, swampy shrubby peaty woods, Aug. 11, 1939 (G, M, NY); *Godfrey & Tryon 121*, Georgetown Co., 4 miles west of Georgetown, creek-bottom through rich lowland woods, June 27, 1939 (G, NY); *Eggert*, Aiken Co., sandy swamps, Aug. 8, 1898 (M); *Godfrey & Tryon 584*, Berkeley Co., 3 miles southeast of Pine-

ville, rich wooded slope, July 14, 1939 (G, NY). GEORGIA: *J. Davis 1860*, Winnette Co., Stone Mountain, June 18, 1921 (M); *Harper 1380*, Pulaski Co., se. of Hawkinsville, wet shady woods at base of sand-hills of Ocmulgee River, June 27, 1902 (NY, TYPE; G, M, US, ISOTYPES); *P. M. Way 9*, near Tallapoosa, July, 1900 (US); *Harper 1867*, Montgomery Co., near Ochwalkee, dry woods along Oconee River, July 1, 1903 (F, G, M, NY, US); *Harper 1063*, Dooly Co., in shaded limesink near Flint River, July 11, 1903 (M); *Eggert*, De Kalb Co., hill north of Stone Mountain, July 24, 1897 (M); *Harper 1160*, Lee Co., in shaded limesink east of Muckalee Creek, Aug. 2, 1902 (NY, US). FLORIDA: *Berg*, near Tallahassee (NY). ALABAMA: *Earle*, Lee Co., Camp Hill, June 23, 1897 (M, NC, NY); *Harper 3525*, Autauga Co., about 2 miles southeast of Booth, swamp of Bridge Creek, June 15, 1936 (ANS, BG, F, G, M, N-ND, NY, US). FIG. 108, a–d.

110. T. POLYGAMUM Muhl. ex Sprengel, Syst. Veg. **2:** 671, 1825. *T. polygamum* Muhl. Trans. Amer. Phil. Soc. **3:** 172, 1793, ut nomen nudum. *T. corynellum* DC. Syst. **1:** 172, 1817. *T. divergens* Link, Enum. Hort. Berol. **2:** 92, 1822. *T. hirsutum* Mertens ex Lec. Bull. Soc. Bot. Belg. **24:** 264, 1885, nomen nudum, nec *T. hirsutum* Willd. ex Lec. l. c. 280, 1885, pariter nudum. *T. leucostylum* Link ex Lec. l. c. 285, 1885, nomen nudum. *T. pubescens* Nuttall ex Trel. Proc. Bost. Soc. Nat. Hist. **23:** 301, 1886, nomen ex synonymis nec *T. pubescens* Pursh, Fl. Amer. Sept. **2:** 388, 1814, nec *T. pubescens* Schleich. ex DC. Syst. **1:** 174, 1817. *T. altissimum* Greene, Leaflets, **2:** 58, 1910, nec *T. altissimum* Wender, Flora, **9:** 358, 1826, nec *T. altissimum* Thomas ex De Massas, Ann. Sc. Nat. ser. 2, **9:** 369, 1838. *T. Bissellii* Greene, l. c. 55, 1910. *T. hepaticum* Greene, l. c. 59, 1910. *T. Mortoni* Greene, l. c. 57, 1910. *T. perelegans* Greene, l. c. 59, 1910. *T. setulosum* Greene, l. c. 56, 1910. *T. glaucodeum* Greene, l. c. 54, 1910. *T. tortuosum* Greene, Ott. Nat. **24:** 54, 1910, nec *T. tortuosum* Jord., Diagn. **1:** 38, 1864. *T. praealtum* Greene, Leaflets, **2:** 89, 1910. *T. perpensum* Greene, Amer. Midl. Nat., **2:** 295, 1912. *Thalictrum Cornuti* L., var. *stipitum* Farwell, Pap. Mich. Acad. Sci. Arts & Lett. **26** (1940): 11, 1941. *Planta* statura variabili, saepius pubescens. *Pubescentia* pilorum uniseriatorum flexuosorum. *Foliolae* membranaceae variabiles (1.0)–2.5–(7.5) cm. longae, obovatae vel oblongae, apice trilobatae lobis integris. *Inflorescentia* paniculata, apice rotunda, *pedunculis* tenuibus. *Filamenta* rigida 3.5–5.0 mm., *apice* clavata et sub antheris constricta. *Antherae* saepius oblongae ca. 1.0 mm. long. *Stigma* 0.5–2.0 mm., alis obscuris et pilis crassiusculis. *Carpella stipite* 0.2–1.0 mm., ventre saepius ovato vel obovato vel ellipsoideo, *nervis* raro parum sinuosis. Floret Junio, Julio et Augusto.—NEWFOUNDLAND: *Fernald, Long & Fogg 269*, Bay of Islands, southern slope of Lark Mountain,

peaty and turfy subalpine meadows, Sept. 1, 1926 (G); *Howe & Lang 1006*, Bay St. George, Aug. 5–7, 1901 (G); *H. Bishop 319*, near Bonne Bay, Neddy Harbor, wooded banks of stream, Aug. 28–30, 1928 (G). "Canada": *Kalm* [?] (Linnaean Society Lond., paratype of *T. dioicum;* G, photograph). Saint-Pierre et Miquelon: *L.-Arsène 264*, Chapeau de Miquelon, 31 juil., 1901 (G); *L.-Arsène 239*, Langlade, vallée de la Belle-Rivière, août, 1901 (G). Quebec: *Victorin, Rolland, Brunel & Rousseau 17,347*, Percé, sur les corniches de conglomérat, 24 juil., 1923 (G); *J. Macoun 66,630, 66,631 & 66,632*, Cap à l'Aigle, Aug., 1905 (G); *Senn 396*, near Wakefield Lake, streamside, July 24, 1938 (G). Prince Edward Island: *J. Macoun 869*, Tignish, July 25, 1888 (G-ND, type of *T. glaucodeum;* G, photographs of same); *J. Macoun*, Mt. Stewart, July, 1888 (US); *Fernald, Bartram, Long & St. John 7493*, Mt. Stewart, springy ditch by railroad, July 30, 1912 (G). New Brunswick: *Rousseau & Bonin 32,047*, junction of Restigouche and Matapedia Rivers, gravelly banks, July 16, 1929 (G); *Chadbourne*, King's Co., Rothesay, July–Aug., 1883 (G); *Fowler*, Kent Co., Bass River (F). Nova Scotia: *J. Macoun 19,006*, Cape Breton Island, Baddeck, thickets, July 28, 1898 (G-ND, type of *T. tortuosum;* G, photographs of the same); *Fernald & Long 23,853*, Yarmouth Co., Parr Lake, thicket at upper border of cobbly beach, Aug. 12, 1921 (G); *Fernald & Long 23,852*, Digby Co., Little Meteghan Lake, thicket, Aug. 9, 1921 (G); *Perry, Wetmore, Hicks & Prince 10,140*, Antigonish Co., Salt Springs, along brook, Sept. 11, 1925 (G). Maine: *B. L. Robinson*, Rangeley Lakes, Middle Dam, Aug. 2, 1903 (G); *Fernald*, Penobscot Co., Orono, rocky bank, July 12, 1892 (G, NE); *Fernald 3*, Aroostook Co., St. Francis, low thickets, Aug. 15, 1893 (G). New Hampshire: *A. H. Moore 4032*, Coos Co., Colebrook, foot of Lombard Hill, east of Monadnock House, shaded roadside, July 20, 1907 (G); *Batchelder*, Cheshire Co., Richmond, shore of Sandy Pond, Sept. 3, 1916 (NE). Vermont: *Day 11*, Bennington Co., Manchester, June 25, July 22, 1898 (G, NE); *Williams*, Ripton, Bread Loaf Inn, July 7, 1908 (G). Massachusetts: *Churchill*, Berkshire Co., Sheffield, low ground, July 19, 1920 (NE); *Fernald & Long 18,470*, Barnstable Co., Sandwich, Spring Hill, low thicket bordering maple and *Chamaecyparis* swamp, Aug. 9, 1919 (NE); *Bicknell 4329*, Martha's Vineyard, Chilmark, July 3, 1913 (NE, NY). Rhode Island: *Fernald*, Kent Co., Warwick, sandy meadow, June 25, 1910 (G, NE); *Ware & Fernald*, Washington Co., Westerly, boggy swale north of Babcock Pond, Aug. 31, 1919 (NE); *Leland*, East Providence, July 4, 1929 (NE). Connecticut: *Bissell*, Southington, July, 1897 (G-ND, fragment from type of *T. Bissellii;* G, photograph of this fragment); *Meredith*, Litchfield Co., Kent Falls, brookside, Aug. 2, 1927

(ANS); *Wright*, Meriden, July 21, 1879 (NE). New York: *Lucy 227*, Chemung Co., Elmira, July 2, 1896 (G-ND, fragments of the type of *T. Cornuti*, var. *stipitum;* G, photographs of these fragments); *Muhlenberg 794*, western New York (ANS, *T. polygamum* !); *Fernald, Wiegand & Eames 14,291*, Oswego Co., Oswego, Mud Pond, swampy woods and thickets overlying Silurian sandstones, Aug. 23, 1922 (G). New Jersey: *E. B. Bartram*, Sussex Co., Rosenkraus Run, July 16, 1917 (G); *Long 46,326*, Hunterdon Co., s. of Van Syckles, along Mulhockaway Creek, open alluvial thicket, June 28, 1935 (ANS); *Long 54,624*, Salem Co., ca. 1 mi. s. s. w. of Friendship, along branch of Muddy Creek, low woods, June 30, 1940 (ANS). Pennsylvania: *Muhlenberg 597* (Willdenow Herb., type of *T. polygamum*); *Nuttall*, Philadelphia (ANS, G, *T. pubescens* Nuttall); *Pierron*, Westmorland Co., Aug. 5, 1877 (F); *Harshberger*, head of Naomi Pines Lake, wet places in woods, July 29, 1904 (G); *Schweinitz*, Bethlehem (ANS). Delaware: *Canby*, Wilmington, 1866 (G). Maryland: *J. D. Smith*, Garrett Co., July 30, 1879 (US). West Virginia: *MacElwee*, Marion Co., west of New England, along stream in ravine, July 28, 1907 (ANS); *E. E. Berkeley*, Summer Co., near mouth of Blue Stone River, July 16, 1930 (G); *Greenman 368*, Randolph Co., Big Run, Sept. 14, 1904 (F, G). Virginia: *Fernald & Long 8267*, Surry Co., James River, rich alluvial woods and thickets back of sand-beach below Sunken Meadow Beach, June 14, 1938 (G); *Fogg 14,744*, Giles Co., 0.5 mi. e. of Bane, wooded slope along Walkers Creek, June 29, 1938 (G); *Allard 732*, Fauquier Co., western slopes of Bull Run Mountains, brook-bank near Hopewell Gap, June 30, 1935; *W. Palmer 22*, Bedford Co., Peaks of Otter, alt. 2500 ft., July 28, 1906 (BG, US); *Small*, Smyth Co., at falls of Holston, alt. 2050 ft., July 9, 1892 (F, G, M, US). North Carolina: *Ashe*, Grandfather Mt., July 9, 1893 (NC); *Blomquist 237*, Durham Co., river banks, May 3, 1932 (G); *Biltmore Herbarium*, Madison Co., near Marshall, banks of Big Ivy Creek, Aug. 8, 1898 (G, M, NY, US). Georgia: *Ruth 10*, Blue Ridge, swamps, July 10, 1900 (US). Ontario: *J. A. Morton 10,607*, Wingham, July 13, 1890 (G-ND, type of *T. Mortoni;* G, photographs of type); idem *865* (G-ND, isotype of *T. Mortoni;* G, photographs of same); *Umbach*, Elmira, swamps, July 13, 1899 (F); *E. L. Greene*, Strathroy, June 16, 1909 (G-ND, type and isotypes of *T. perpensum;* G, photographs of the type and of one isotype); idem, June 12, 1909 (G-ND, paratype of *T. perpensum*). Ohio: *F. E. Leonard 87–112½*, Elynia, July 14, 1887 (US). Indiana: *Friesner*, Floyd Co., New Albany, Aug. 23, 1923 (N-ND). Kentucky: *Smith & Hodgdon 3929*, Wayne Co., southwest of Monticello, Beaver Creek, shady ledge, July 12–14, 1937 (G); *Smith & Hodgdon 3695*, Rockcastle Co., between Berea and Mt.

Vernon, slough, July 8, 1937 (G, NY); *Short 2,* alluvium of the Kentucky River (ANS); *Lea 3,* Kenton Co., Banklick Creek, 1834–44 (ANS). Tennessee: *Kearney 602,* Cocke Co., near Lemon's Gap, Sept. 3, 1897 (G-ND, type of *T. perelegans;* M, NY, US, isotypes); idem *602½ & 603,* Sept. 8 (M, NC, NY, US); *Svenson 4050,* Morgan Co., Rugby, mossy banks of stream, Aug. 19, 1930 (BG). Fig. 110, a–c.

Thalictrum polygamum Muhl. is antedated by two other validly published names and perhaps by four. Although we know that this name is not the right one for the species, it seems preferable to keep it until we make sure of the right name to take.

Gray gives 1813 (Cat. Plant. Amer. Sept., p. 54) in his Synoptical Flora as the right date for the valid publication of *T. polygamum* Muhl. He considered the two words "smooth, polygamous" as a valid description. Actually these were not intended to be a description, but common names, that is "smooth meadow-rue, polygamous meadow-rue", as stated at the beginning of the Muhlenberg's Catalogue. The first valid publication is, then, Sprengel's in 1825, later than *T. corynellum* DC. 1817, *T. divergens* Link 1822, *T. pubescens* Pursh 1814, and *T. purpurascens* L. 1753.

111. T. polygamum Muhl., var. hebecarpum Fern., Rhodora, **10:** 49, 1908. *T. leucocrinum* Greene, Ott. Nat., **24:** 29, 1910. *T. zibellinum* Greene, l. c. 30, 1910. *T. labradoricum* Greene, l. c. 53, 1910. *T. terrae-novae* Greene, l. c. 52, 1910. *T. canadense* Miller, var. *hebecarpum* (Fern.) House, Bull. N. Y. State Mus. **254:** 346, 1924. *Planta* robustior saepius pubescens et sesquimetralis. *Inflorescentia* ampla subcorymbosa, *pedunculis* crassiusculis et nonnunquam incurvatis. *Filamenta* saepius 5.0–6.5 mm. conspicue clavata. *Antherae* ca. 1.2 mm. *Stigma* 1.5–3.5 mm. *Carpella* matura saepius oblanceolata. Floret Julio et Augusto.—Labrador: *H. Bishop 318,* Petty Harbor, 52° 25′ N., 55° 40′ W., sphagnous spruce woods, July 12, 1928 (G); *Fernald & Wiegand 3438,* Blanc Sablon, by brooks, Aug. 6, 1910 (G). Newfoundland: *Robinson & Schrenk 187,* St. John's, Rennie's River, rocky banks, Aug. 4, 1894 (US, type of *T. terrae-novae;* ANS, F, G, NY, isotypes); *Fernald & Wiegand 3437,* Port Saunders, gravelly shore, Aug. 6, 1910 (G); *Fernald & Long 28,274,* Bard Harbor Hill, meadow below limestone escarpment, Aug. 21, 1925 (G). Quebec: *Williams & Fernald,* Témiscouata Co., Rivière du Loup, gravelly thicket by the Saint Lawrence, Aug. 2, 1902 (G, type of *T. polygamum* var. *hebecarpum*); *Fernald, Bartram, Long & St. John 7492,* Magdalen Islands, Grindstone Island, Grindstone, wet clearing, July 22, 1912 (G);

Richardson 867, Lake Mistassini, wet meadows around springs and along rivulets, July 15, 1870 (C); *Churchill*, Terrebonne Co., Lac Tremblant, July 18, 1922 (G). PRINCE EDWARD ISLAND: *J. Macoun*, Mt. Stewart, Aug. 17, 1888 (G). NEW BRUNSWICK: *J. D. Smith*, Campobello Island, July 17–Aug. 20, 1888 (US, type and isotype of *T. leucocrinum*); *F. T. Hubbard*, Shediac Cape, rich meadow, with alder, July 21, 1914 (G); *Fowler 2*, St. Andrew's, July 3, 1900 (G); *Fernald & Long 13,641*, Carleton Co., Woodstock, gravelly river-thickets and bushy terraces, July 14, 1916 (G). NOVA SCOTIA: *J. Macoun 21,134*, Sable Island, not uncommon on the old land, July 24 & Aug. 2, 1899 (G, isotype of *T. zibellinum*); *Perry & Roscoe 217*, St. Paul Island, between Petries Pond and White Spring, Aug. 3, 1929 (G); *Long & Linder 21,255*, Yarmouth Co., Tusket, peaty spruce and alder thickets bordering swales, July 15, 1920 (G). MAINE: *C. A. E. Long*, Knox Co., Matinicus, swamp, July 6, 1919 (NE); *E. F. Williams*, Mt. Katahdin, Depot Pond, July 16, 1900 (G); *Williams, Collins & Fernald*, Aroostook Co., Presque Isle, July 12, 1902 (G, NE); *A. F. Hill 1481*, Hancock Co., Swans Island, July 8, 1914 (NE). NEW HAMPSHIRE: *Bullard*, Merrimac Co., Hill, roadside, July 12, 1933 (NE); *Pease 16,721*, Coos Co., Randolph, meadow, July 31, 1917 (NE); *C. F. Batchelder*, Rockingham Co., Fremont, edge of swampy woods, July 20, 1927 (NE). VERMONT: *E. F. Williams*, Addison Co., Ripton, Bread Loaf Inn, July 7, 1908 (NE); *Leland*, Windsor, meadows, June 27, 1880 (NE); *Kennedy*, Mount Holly, roadside, June 26, 1908 (G). MASSACHUSETTS: *F. T. Hubbard*, Essex Co., Manchester, wet rich loam by brook, July 15, 1913 (NE); *Sanford 750*, Bristol Co., Fall River, low ground, thicket, July 6, 1914 (NE); *Churchill*, Norfolk Co., Milton, July 2, 1899 (NE). NEW YORK: *Svenson 4578*, Greene Co., N. slope of Hunter Mt., margin of a cold brook, alt. 3500 ft., Aug. 24, 1931 (G); *Muenscher & Maguire 1179*, Franklin Co., hillside of Titus Mountain, roadside, July 13, 1930 (G); *Burnham*, Washington Co., southern W. Fort Ann, east of Tripoli, along Halfway Brook, July 2, 1897 (G). FIG. 111, a and b.

This variety is not a well cut unit but a rather well marked extreme commoner than the typical in northern parts of the range of the species. The following variety exhibits a similar behavior but the relation between the staminate and the pistillate plants has not been made yet. A third variety is perhaps worth recognition in the southern Appalachian upland (*T. altissimum* Greene and *T. perelegans* Greene).

112. T. POLYGAMUM Muhl., var. **intermedium,** var. nov. ? *T. viride* Greene, Leaflets, **2:** 56, 1910. *Planta* metralis pu-

bescens. *Foliolae* subcoriaceae et revolutae. *Inflorescentia* paniculata. *Antherae* 1.5–2.0 mm. Rhode Island: *F. S. Collins 2354*, Bristol, July 12, 1918 (NE). Connecticut: *Woodward*, Franklin, roadside, in rich moist soil, June 24, 1914 (G, type and isotype of *T. polygamum* var. *intermedium;* NE, isotype); idem, June 26 (G); idem, July 1, 1915 (NE). Minnesota: *Coues*, 1873, Pembina (G). Fig. 112, a and b.

The type of *T. viride* Greene has not been seen by me.

113. T. dasycarpum Fischer & Lall. ex Fisch., Mey. & Lall. Ind. Sem. Hort. Petrop. **8:** 72, 1842. *T. Cornuti* L., var. β Fisch. Mey. & Lall. l. c. 72, 1842. *T. virginicum* Drege ex Lec., Bull. Soc. Bot. Belg. **24:** 323, 1885, nomen ex synonymis. *T. purpurascens* L., var. *dasycarpum* (Fisch. & Lall.) Trel., Proc. Bost. Soc. Nat. Hist. **23:** 301, 1886. *T. vegetum* Greene, Midl. Nat. **1:** 103, 1909. *T. albens* Greene, Amer. Midl. Nat. **2:** 292, 1912. *T. Moseleyi* Greene, l. c. 294, 1912. *T. Nortoni* Greene, l. c. 292, 1912. *T. Sandbergii* Greene, l. c. 293, 1912. *T. Wightianum* Greene, l. c. 293, 1912. *Leucocoma dasycarpa* (Fisch. & Lall.) Nieuwland, Amer. Midl. Nat. **3:** 324. 1914. *L. albens* (Greene) Lunell, Amer. Midl. Nat. **4:** 361, 1916. *L. vegeta* (Greene) Lunell, l. c. 1916. *Planta* metralis et pubescens. *Pubescentia* saepius densa pilorum uniseriatorum et flexuosorum. *Rami* et *folia* plus minusve conferta. *Foliolae* coriaceae, margine revoluto, oblongae, apice trilobatae, lobis acutis. *Inflorescentia* paniculata apice acuta. *Filamenta* capillaria et sub antheris paululum dilatata nec constricta, ca. 4 mm. *Antherae* 1.5–2.5 mm., oblongo-linearia, *acumine* 0.1–0.4 mm. *Stigma* 2–3 mm. *Receptaculum* ad basem capitis fructuum. *Carpella* matura *stipite* 0.1–0.3 mm., ventre saepius ovato, apice nonnunquam incurvato, *nervis* haud sinuosis. Floret Junio Julioque.—Russia (cultivated): ex horto botanico petropolitensi (US, presumably from type colony in the garden). North America: *Franklin Expedition* (G). Ontario: *C. F. Williamson 1949*, Fort William, river-banks, July 31, 1912 (ANS); *E. & D. M. Anderson 26,018B*, Timagami Region, Sandy Inlet, July 21, 1926 (G); *Pease & Ogden 25,038*, Manitoulin Island, Providence Bay, beach, July 5, 1935 (G); *Taylor, Hosie, Fitzpatrick, Losee & Leslie 2280*, Algoma District, Carp Lake, cedar-yellow birch association, July 25, 1935 (C); *Taylor, Losee & Bannan 904*, Thunder Bay District, Marie Louise Creek, along stream, Aug. 13, 1936 (C); *W. S. 62,298*, Moose Factory, July 15, 1904 (C). Michigan: *W. F. Wight 118b*, Allegan Co., along Kalamazoo R. at Allegan, Sept. 11, 1902 (US, type, on two sheets, of *T. Wightianum*); *Barlow*, Marquette Co., Turin, by flowing water, July 8, 1901 (G); *Fernald & Pease 3307*, Houghton Co., southwest of Houghton, border of swamp, July 3, 1934 (G); *L. H. Bailey*,

near Lansing, June 13, 1886 (G). OHIO: *Webb 491*, Portage Co., Garrettsville, June 24, 1901 (G); *Moseley*, Erie Co., Oxford Tp., June 8, 1895 (US, type of *T. Moseleyi*). INDIANA: *Deam 57,871*, Wells Co., Bluffton, June 21, 1937 (G); *Deam 57,873*, Noble Co., Wolcottville, in a marsh, June 22, 1937 (G); *H. W. Clark 1870*, near Lake Maxinkuckee, June 26, 1901 (US). WISCONSIN: *H. W. Edmonds*, Vilas Co., Eagle River, 1926 (NY); *Fassett & Wilson 4301*, Buffalo Co., Fountain City, sandy R. R. embankment, Aug. 25, 1927 (G); *Schuette*, Brown Co., Dach's Creek, July 11, 1895 (G, NC). ILLINOIS: *Bebb*, Fountaindale, 1867 (G); *Vasey*, N. Ill. (G). MANITOBA: *Herriot 69,801*, Hamiota, June 22, 1906 (G). MINNESOTA: *Sandberg 1193*, Itaska Lake, wet places, July, 1891 (US, type and isotype of *T. Sandbergii*); *Ballard*, Nicolet Co., Swan Lake, June, 1892 (G); *Rosendahl 666*, Spring Grove, June 30, 1902 (G); *Arthur & Bailey B460*, Agate Bay, July 29, 1886 (G); *Stevens 186*, Muskoda, July 19, 1936 (G, UC). IOWA: *Pammel 596*, McGregor, Aug. 15, 1925 (G); *Pammel & Zimmerman 275*, Feinback, June 23, 1925 (G); *Ball 2*, Ames, July 18, 1896 (G). MISSOURI: *E. J. Palmer 18,991*, Atchison Co., near Watson, wooded slopes of loess hills, Sept. 4, 1920 (M); *Palmer & Steyermark 41,055*, Schuyler Co., Chariton River, low open woods, July 1, 1933 (M); *Palmer & Steyermark 41,242a*, Grundy Co., Trenton, woods along creek, July 4, 1933 (M); *Palmer & Steyermark 41,327*, Mercer Co., Saline, along north-facing wooded bluff of Little River, July 5, 1933 (M). NORTH DAKOTA: *Lunell*, Ramsay Co., Devil's Lake, in woods, July 16, 1902 (G-ND, type of *T. vegetum;* G, photographs); *Lunell*, Devil's Lake, July 1, 1905 (G-ND, paratype of *T. vegetum;* G, photographs); *Lunell*, Pierce Co., Pleasant Lake, thickets, June 19, 1901 (F, G); *Lunell*, McHenry Co., Towner, July 27, 1913 (F, US). SOUTH DAKOTA: *E. J. Palmer 37,636*, Washabaugh Co., Interior, in deep ravines, June 29, 1929 (G); *T. A. Williams*, vicinity of Brookings, June 17, 1896 (US); *Hayward 1594*, Black Hills, Hot Springs, mixed prairie, 1927 (F). NEBRASKA: *Tolstead 513a*, Valentine, along the banks of the Niobrara river, July 27, 1936 (G); *F. Clements*, St. James, June 24, 1893 (G, US); *Rydberg 1413*, on South Fork of Dismal River, in meadow, Aug. 14, 1893 (G). KANSAS: *J. B. Norton 5a*, Riley Co., 1896 (US, type of *T. Nortoni;* G, M, NY, US, isotypes); *M. White*, Cowley Co., June, 1898 (M); *Rydberg & Imler 44*, Miami Co., between Olathe and Pleasanton, June 18, 1929 (NY). SASKATCHEWAN: *Bourgeau*, 1857–1858 (G); *Herriot 69,801a*, Yorkton, damp thickets, July 6, 1906 (G). ALBERTA: *Herriot 69,800*, 6 miles e. of Edmonton, Aug. 24, 1906 (F, G); *E. H. Moss 2209*, Edmonton, amongst shrubs, July 6, 1931 (G). MONTANA: *R. S. Williams 418*, Great Falls, July 4 & July 20, 1886 (US). IDAHO: *Leiberg 1576*, Clarks Fork Valley, below Weeksville, alt.

650 m., Aug. 23, 1895 (G). Wyoming: *F. L. Bennett 827*, Black Hills, Sand Creek Canyon, shady flood-plain, alt. 3800 ft., June 24, 1938 (CA); *A. Nelson 8338*, Laramie Co., Badger, thickets on river-banks, July 1, 1901 (US). Colorado: *Cowen 27 & 32*, Fort Collins, river-bank, alt. 5000 ft., July 1, 1895 (G, US). New Mexico: *Standley 13,541*, Colfax Co., vicinity of Ute Park, meadow along creek, alt. 2200 to 2900 m., Aug. 22, 1916 (US); *Arsène & Benedict 17,431*, vicinity of Watrous, alt. 1950 m., Aug. 27, 1926 (CA, US); *Vasey*, Las Vegas, 1881 (US). Arizona: *Haugh*, Showlow, July 14 (US). Fig. 113, a and b.

A study of the polygamo-dioeciousness of this species was published by J. H. Schaffner in the Ohio Journ. Sci. **20:** 25, 1919.

114. T. dasycarpum Fisch. & Lall., var. **hypoglaucum** (Rydberg), stat. nov. *T. hypoglaucum* Rydb. Brittonia, **1:** 88, 1931. *T. macrostigma* Torr. ex Trel., Proc. Bost. Soc. Nat. Hist. **23:** 301, 1886, ut synonymon. *T. amphibolum* Greene, Fedde, Rep. Nov. Spec. **7:** 255, 1909. *T. dasycarpum* Fisch. & Lall., f. *hypoglaucum* Steyermark, Rhodora, **40:** 178, 1938. *Planta* saepius glabra. *Foliolae* saepius membranaceae. *Filamenta* 4–7 mm. *Antherae* 2.2–3.2 mm. *Stigma* 2.5–5.0 mm. *Receptaculum* ad centrum capitis fructuum. *Carpella* matura recta ventre lanceolato et *nervo* ventrali paullulum convexiore quam dorsali. Floret Majo et Junio. Missouri: *Standley 9298*, Greene Co., creek-bottom, vicinity of Ash Grove, Aug. 24, 1912 (US); *E. J. Palmer 36,684*, Johnson Co., Columbus, thickets, limestone hills and low woods, June 21, 1930 (G); *Bush 4*, Independence, June 26, 1895 (NY); *Steyermark 5938*, Nodaway Co., Parnell, dry open woods of Bunker Hill, June 20, 1938 (F). Arkansas: *E. Palmer 4*, between Fort Cobb and Fort Arbuckle, 1868 (NY, US, *T. macrostigma*); *Bush 2479*, Miller Co., woods, April 27, 1905 (M); *Fassett 19,760*, Hempstead Co., Hope, April 20, 1938 (G). Louisiana: *Hale*, Alexandria, 1840 (NY, US, *T. macrostigma*). South Dakota: *T. A. Williams*, Big Stone, Aug. 7, 1895 (US); *Hayward 135*, Spearfish Canyon, streamside, Aug. 1, 1926 (NY); *Brenckle 41–27*, east of Malette, river-bottom, in woods, June 16, 1941 (G). Nebraska: *Bates*, Red Cloud, June 11, 1906 (G); *E. S. Bacon*, Neligh, June 15, 1896 (G). Kansas: *Hall*, Aug., 1870 (F); *Kellerman*, Manhattan, 1887 (M). Oklahoma: *G. W. Stevens 2086*, Washington Co., Copan, in moist shady woods, Aug. 15, 1913 (G); *Merrill & Hagan 546*, Platt National Park, June 3, 1935 (F, US); *G. W. Stevens 920*, Caddo Co., Hinton, bottoms of Devil's Canyon, June 15, 1913 (G, US); *J. Clements 11,583*, Comanche Co., Fort Sill, June 2, 1916 (G). Texas: *Hall 2*, Dallas, creek-banks, 1872 (NY, type of *T. hypoglaucum;* F, G, M, US, isotypes); *Eggert*, Mowie, woods, June 13, 1898 (M, NY, paratypes of *T. hypoglaucum*); *Lindheimer*,

Houston, April, 1842 (G, US); *Lewton 57*, Victoria Co., Victoria, March 23, 1905 (US). MONTANA: *Spragg 369*, Square Butte, canyons, July 15, 1901 (G); *Watson 7*, near Frenchtown, Aug. 4, 1880 (G, US); *M. E. Jones*, Ravalli, Middle Temperate Life Zone, alt. 3000 ft., July 14, 1909 (CA, UC). COLORADO: *Cowen 32*, Fort Collins, river-bank, alt. 5000 ft., July 1, 1895 (G); *Bethel*, Platte, July 31, 1916 (US). ARIZONA: *J. W. Lead 1511*, White Mountains, meadows, July 30, 1935 (US); *Rusby*, Oak Creek, 1883 (ANS, F, G, NY, US). WASHINGTON: *Kreager 377*, Box Canyon, Aug. 2, 1902 (US). BRITISH COLUMBIA: *J. Macoun 10,059*, Waterton Lake, thickets, July 27, 1895 (C); *J. Macoun 860*, Warm Springs, open places, July 5, 1890 (C). FIG. 114, a and b.

The carpel is not always perfectly closed in the genus *Thalictrum.* Near the base of the style the ventral nerves are free for a short distance and not infrequently there is a transition in the tissue of the carpel between the two ventral nerves. This is more easily seen in nearly mature fruits of *T. dasycarpum* Fisch. & Lall. var. *hypoglaucum.*

SPECIES HAUD SATIS COGNITA

115. T. DOMINGENSE Urban, Symb. Ant. **6:** 10, 1909. *Caulibus* tenuibus debilibus glabris; *foliis* ter usque semel pinnatis, *foliolis* ambitu suborbicularibus, subquadratis v. rhomboideis, raro usque infra medium 3-sectis, plerumque antice trilobis v. tricrenatis, glabris; *inflorescentiis* 1–2-floris; *sepalis* 3.5 mm. longis, albis, subtus violaceo-maculatis; *antheris* ovatis obtusis; *acheniis* sessilibus anguste lanceolatis, longitrorsum striatis, rostro uncato excepto cr. 3 mm. longis, 0.7 mm. latis.

Caules debiles, verisimiliter plantis aliis incumbentes, inferne usque 1.5 mm., medio vix supra 0.5 mm. crassi, teretes v. obtusanguli. *Stipulae* semiovatae, inferae usque 4 mm. longae, superiores sensim decrescentes, margine saepius dentatae, marcescentes. *Folia* inferiora usque 5 cm. longe petiolata; *foliola* 1.3–0.5 cm. diametro, lobis integris v. obsolete crenatis, lateralia 1–4 mm., terminalia usque 7 mm. longe petiolulata, supra obscure, subtus pallide viridia v. glaucescentia, supra obsolete, subtus manifeste nervosa. *Flores* primarii (terminales) 10–12 mm., secundarii (ex axilla folii simplicis v. bracteiformis abeuntes) usque 3.5 cm. longe pedicellati. *Sepala* non unguiculata, ovata v. ovalia, apice obtusa, 2 mm. lata. *Stamina* cr. 10; *filamenta* 2 mm. longa; *antherae* 0.5 mm. longae, muticae. *Carpella* 8–10; *stylus* evolutus; *stigmata* revoluta, stylo fere duplo longiora. *Achenia* stylo et stigmate persistente rostrata, striis circumcirca 7–8 prominentibus notata, tenuioribus hinc illinc interjectis.

Hab. in Haiti in Morne la Selle prope fontem Rivière Blanche de Jacmel 1800–1900 m. alt., m. Aug. flor. et fruct.: Christ n. 1848, 1848b.

Obs. Species hujus generis prima ex Antillis cognita, peculiaris, habitu foliorum *Th. Fendleri* Engelm. et *Th. Wrightii* Gray (ex. America sept.) in memoriam revocans, sed ab iis statura, inflorescentia, antheris, acheniis omnino diversa.

The preceding text is a copy of the original description. I have not seen any material of this species but it seems to differ from the continental species and probably belongs to the *Debilia.*

NOMINA DUBIA

T. purpurascens L., Sp. Pl., **1:** 546, 1753. *T. dioicum* L., var. *α purpurascens* (L.) Provancher, Fl. Can. **1:** 5, 1862.

Of the type of this species in the herbarium of Linnaeus I have seen only the negative of a 35 mm. photograph. It is the upper half of a staminate plant collected in early bloom and looks pretty much like *T. revolutum* DC., but could be just as well *T. polygamum* Muhl.

T. pubescens Pursh, Fl. Amer. Sept. **2:** 388, 1814. *T. polygamum* Muhl., var. *pubescens* (Pursh) K. C. Davis, Minn. Bot. Stud. **2:** 514, 1900.

The descriptions of *Thalictra* given by Pursh in his Flora are all more or less obscure to me and there are a few too many. I have seen five of Pursh's collections from the B. S. Barton herbarium. But that did not elucidate the problem. I suspect the type to be in the Delessert Herbarium and to belong either to *T. polygamum* Muhl. or to *T. revolutum* DC.

T. carolinianum Bosc and var. subpubescens DC. Syst. **1:** 174, 1817, nec *T. carolinianum* Walter, Fl. Car., 157, 1788.

I have not seen any typical material of this species and its variety, and Lecoyer, who has seen the type specimens in the Delessert herbarium, considers them as synonyms of *T. polygamum* and *T. dasycarpum,* but his account is not very satisfactory. De Candolle's description is not very clear, but as the name *T. carolinianum* Bosc is already preoccupied by one of Walter's species, its correct interpretation is of little consequence.

T. megacarpum Torr. Cat. Pl. Fremont Exped. 87, 1845. nomen nudum. *T. megacarpum* Torr. ex Rydberg, Fl. Rocky

Mts. 290, 1918. *T. occidentale*, var. *megacarpum* (Torr.) St. John, Fl. South. Wash. & adj. Idaho, 158, 1937.

The type of this species I have seen, but it greatly puzzles me. The foliage is typical of *T. occidentale* Gray var. *palouense* St. John; its inflorescence is pretty much like that of *T. confine* Fern. var. *columbianum* (Rydb.) nostrum, and the fruit, although closer to certain forms of *T. Fendleri* Engelm., also recalls that of *T. occidentale* Gray var. *typicum*. Such a specimen I consider as being either abnormal or of hybrid origin.

Other names have been discarded for various reason but none of them is likely to be entitled to supersede any of the names adopted in this paper. The list of these names follows:

Sect. CAMPTONOTUM Prantl, Nat. Pflanzenf. 3, **2:** 66, 1888.
Sect. CAMPTONOTUM, c. PETALOIDEA Prantl, l. c.
Sect. CAMPTOGASTRUM, c. PLATYCARPA Prantl, l. c.
T. MEXICANUM DC. Syst. **1:** 187, 1817, nomen provisorium.
T. CORNUTI L., var. MONOSTYLA [author?], Bot. Zeit. **3:** 218–219, 1845, nomen nudum.
T. PURPUREUM K. C. Davis, Minn. Bot. Studies, **2:** 513, 1900, nomen ex synonymis *Thalictri purpurascentis* L., nec. *T. purpureum* Schang ex Pall., N. Nord. Beitr., **6:** 42.

EXPLANATION OF FIGURES

FIGS 2–25 (p. 351), all × 4

FIG. 2. THALICTRUM HULTENII Boivin: stamen, *Everman 120*. 3. T. ALPINUM L., var. TYPICUM: a) sepal, *Blaisdell*, 1800; b) stamen, *Eugenius*, 26 julii, 1935; c) ovary, *Pease & Smith 25,761;* d) bract, peduncle and fruit, *Fidtz*, Aug. 11, 1910. 5. T. ALPINUM L., var. STIPITATUM Yabe: a) ovary, *Rock 17,865;* b) fruit, *Takemoto 591*. 8. T. BAICALENSE Turcz.: fruit, *Hsia 2310*. 9. T. BAICALENSE Turcz., var. MEGALOSTIGMA Boivin: fruit, *Fang 3619*. 10. T. PHILIPPINENSE C. B. Robinson: fruit, *Williams 1137*. 11. T. FILAMENTOSUM Max.: fruit, *Maximovicz*, Amur. 12. T. CLAVATUM DC.: a) peduncle and sepal, *Magee*, Lickstone; b) peduncle and anther, id.; c) seed, *Thaxter*, Cullowhee; d) section of fruit with seed, *Magee*, Lickstone; e) peduncle and fruit, id. 13. T. DECLINATUM Boivin: a) stamen, *Tsiang 5662;* b) fruit, id. 14. T. ACUTIFOLIUM (Hand.-Mazz.) Boivin: a) sepal, *Handel-Mazzetti 11,173;* b) stamen, id.; c) fruit, *Ko 52,821*. (The "c" of "14c" has been omitted by error.) 15. T. MICROGYNUM Lec.: fruit, *Henry 3932*. 16. T. UNGUICULATUM Boivin: a) sepal, *Tsiang 5662;* b) fruit, id. 17. T. GUEGUENII Boivin: a) sepal, *Tsang 23,486;* b) anther, id.; c) fruit, id. 18. T. MIRABILE Small: a) stamen, *Smith & Hodgdon 3928;* b) fruit, id.; c) fruit, *Earle 2212*. Fig. 18c is placed next to fig. 12e. 19. T. TUBERIFERUM Max.: fruit, [*?Watanabe*], Tagakushi-san. 20. T. WATANABEI Yatabe: fruit, [*?Watanabe*], Nanokawa, 1892. 21. T. CHIAONIS Boivin: a) stamen, *Chiao 18,719;* b) fruit, id. 23. T. ICHANGENSE Lec.: fruit, *Wilson 492*. 25. T. SPARSIFLORUM Turcz., var. TYPICUM: a) stamen, *Komarov 724;* b) fruit, id.

Figs. 26–43 (p. 371), all × 4

Fig. 26. T. sparsiflorum Turcz., var. Richardsonii (Gray) Boivin: fruit, *Kellogg 211*. 27. T. sparsiflorum Turcz., var. saxomontanum Boivin: fruit, *Nelson 6364*. 28. T. sparsiflorum Turcz., var. nevadense Boivin: fruit, *Heller 7056*. 29. T. aquilegifolium L.: a) section of fruit and seed, *Puget*, Chablais; b) peduncle and fruit, id. 30. T. aduncum Boivin: a) sepal, *Humbert 7448;* b) stamen, id.; c) ovary id.; d) peduncle and fruit, id. 31. T. rhynchocarpum Dill. & Rich.: a) stamen, *Linder 2116;* b) sepal, id.; c) ovary, id.; d) peduncle and fruit, *Schimper 472*. 32. T. innitens Boivin: a) sepal, *Swynnerton 352;* b) stamen, id.; c) ovary, id.; d) peduncle and fruit, *Owan 598*. 33. T. Chapinii Boivin: a) sepal, *Chapin 386;* b) stamen, id.; c) ovary, id.; d) peduncle and fruit, *Mearns 2320*. 34. T. impexum Boivin: a) sepal, *Curtis 839;* b) stamen, id.; c) ovary, id.; d) fruit, *Mearns 630*. 36. T. Steinbachii Boivin: a) sepal, *Steinbach 8869;* b) ovary, id.; c) fruit, id. 37. T. Steyermarkii Standley: a) ovary, *Standley 85,140;* b) fruit, id. 38. T. cincinnatum Boivin: a) ovary, *Steinbach 9231;* b) fruit, id. 39. T. macrocarpum Gren.: fruit, *Cosson*, Gourzy. 40. T. inuncans Boivin: a) sepal, *Fiebrig 2440;* b) ovary, id.; c) stamen, id. 41. T. Galeottii Lec.: a) stamen, *Galeotti 4541;* b) ovary, id.; c) fruit, id. Fig. 41a and 41b were drawn from actual specimens; fig. 41c from a photograph of the type. 42. T. Hintonii Boivin: fruit, *Hinton 6743*. 43. T. decipiens Boivin: a) ovary, *Herrera 1047a;* b) fruit, id.

Figs. 44–69 (p. 409) all × 4, except 51a and 63a, these × 1/5

Fig. 44. T. viridulum Boivin: fruit, *Seibert 204*. 45. T. panamense Standley: fruit, *Davidson 791*. 46. T. Macbrideanum Boivin: a) sepal, *Macbride 4466;* b) stamen, id.; c) ovary, id.; d) fruit, id. 47. T. Deamii Boivin: fruit, *Pringle 5071*. 48. T. grandifolium Wats.: fruit, *Jones*, Soldier Canyon. 49. T. Hernandezii Tausch: fruit, *Abbott 238*. 50. T. pachuense Rose: fruit, *Pringle 9678*. 51. T. Standleyi Steyermark: a) leaflet, *Steyermark 36,258;* b) fruit, *Standley 84,271*. 52. T. Johnstonii Stand. & Steyer.: a) ovary, *Heyde & Lux 2977;* b) stamen, *Johnston 1643;* c) nearly mature fruit, *Heyde & Lux 2977*. 53. T. lanatum Lec.: fruit, *Purpus 2714*. 54. T. Pennellii Boivin: fruit, *Pennell 18,505*. 55. T. parvifructum Boivin: fruit, *Pennell 19,555*. 56. T. strigillosum Hemsley: fruit, *Rose & Hay 6188*. 57. T. laeteviride Boivin: fruit, *Johnston & Muller 463*. 58. T. lasiostylum Presl: fruit, *Pennell 14,338*. 59. T. subpubescens Rose: fruit, *Pringle 11,917*. 60. T. pubigerum Bentham: fruit, *Pringle 4143*. 61. T. Conzattii Boivin: fruit, *Conzatti & Gonzalez 314*. 62. T. sessilifolium Boivin: *Nicolas*, Hacienda Alamos. 63. T. refractum Boivin: a) ramification of the petiole, *Cuatrecasas 9664;* b) fruit, id. 64. T. peninsulare (Brandegee) Rose: a) sepal, *Brandegee*, El Taste; b) stamen, id.; c) ovary, id.; d) peduncle and fruit, id. 65. T. gibbosum Lec.: peduncle and fruit, *Pringle 6511*. 67. T. rutidocarpum DC.: fruit, *Dombey*, Peru. Drawn from a photograph of the type. 68. T. vesiculosum Lec.: fruit, *Penland & Summers 1014*. 69. T. Nelsonii Boivin: a) ovary, *Nelson 1788;* b) fruit, id.

Figs. 70–89 (p. 429), all × 4

Fig. 70. T. podocarpum HBK.: a) ovary, *Killip & Smith 16,017;* b) peduncle and fruit, id. 71. T. Venturii Boivin: a) peduncle and stamen, *Venturi 10,026;* b) ovary, id.; c) fruit, id. 72. T. Lankesteri Standley: a) sepal, *Brenes 14,506;* b) stamen, id.; c) ovary, id.; d) fruit, *Lankester 337*. 73. T. Torresii Standley & Boivin: a) sepal, *Torres 187;* b) stamen, id.; c) ovary, id.; d) fruit, id. 74. T. guatemalense C. DC. & Rose: a) sepal, *Arsène 2610;* b) stamen, id.; c) ovary, id.; d) fruit, *Hayes*, Las Vacas. 75. T. Treleasii Boivin: a) sepal, *Langlassé 1061;* b) stamen, id. 76. T. peltatum DC.: a) sepal, *Hinton 4547;* b) stamen, *Alaman*, Mexico; c) ovary, *Hinton 4547*. Fig. 76b was drawn from the photograph of the type. 77. T. Pringlei Wats.:

a) sepal, *Pringle 2478;* b) stamen, id.; c) ovary, id.; d) fruit, *Leavenworth & Hoogstraal 989.* 79. T. ROSEANUM Boivin: a) sepal, *Pringle 7205;* b) stamen, id.; c) ovary, *Pringle 7448;* d) fruit, *Pringle 8261.* 80. T. ARSENII Boivin: a) sepal, *Arsène*, Jaripeo; b) stamen, *Arsène 5470;* c) fruit, id. 81. T. JALISCANUM Rose: a) sepal, *Hinton 4259;* b) stamen, id.; c) fruit, *Hinton 6557.* 82. T. CUERNAVACANUM Rose: a) sepal, *Pringle 6878;* b) ovary, id.; c) stamen, id.; d) peduncle and fruit, id. 84. T. TEXANUM (Gray) Small: a) sepal of pistillate flower, *Hall 3;* b) ovary, id.; c) sepal of staminate flower, id.; d) peduncle and stamen, id.; e) peduncle and fruit, id.; f) section of fruit and seed, id. 85. T. DEBILE Buck.: fruit, *Buckley*, Alabama. 86. T. ARKANSANUM Boivin: fruit, *Bush 2445.* 87. T. PUDICUM Standley & Boivin: portion of stem with stipule and base of petiole, *Leavenworth & Hoogstraal 1013.* 88. T. MADRENSE Rose: fruit, *Rose 2232.* 89. T. PINNATUM Wats.: a) sepal of staminate flower, *Townsend & Barber 134;* b) sepal of pistillate flower, id.; c) fruit, *LeSueur 1059.*

FIGS. 92–114 (p. 467), all × 4; except 101e, × 1/5, and 110c and 113a, these × 3

FIG. 92. T. VENULOSUM Trel.: a) sepal of pistillate flower, *Roy*, Bellerive; b) ovary, id.; c) sepal of staminate flower, *Potter 380;* d) stamen, *Herriot 69,803;* e) fruit, *Scamman 2892.* 93. T. CONFINE Fern.: a) sepal of pistillate flower, *Potter 381;* b) sepal of staminate flower, *Victorin & Rolland 18,777;* c) ovary, id.; d) stamen, *Potter 382;* e) fruit, *Knowlton*, Grand Isle; f) section of fruit and seed, *Potter 383.* 96. T. STEELEANUM Boivin: a) sepal of pistillate flower, *Morris 1527;* b) sepal of staminate flower, *Steele*, Feeder Dam Island, July 10; c) stamen, *Steele*, Feeder Dam Island, May 10; d) fruit, *Long & Bartram 1292.* 97. T. CORIACEUM (Britt.) Small: fruit, *Curtiss*, Bedford Co. 99. T. OCCIDENTALE Gray, var. TYPICUM: fruit, *Hall*, 1871. 101. T. OCCIDENTALE Gray, var. PALOUENSE St. John: a) peduncle and fruit, *Raup & Abbe 3867;* b) peduncle and fruit, *Kirkwood 1876;* c) section of fruit and seed, id.; d) stamen, *Cusick 1515;* e) inflorescence, *Kirkwood 1876.* 102. T. FENDLERI Engelm.: a) peduncle and stamen, *Metcalfe 248;* b) section of fruit and seed, *Munz 8696;* c) fruit, id.; d) fruit, *Parish 1483;* e) fruit, *Heller 11,669.* 103. T. FENDLERI Engelm., var. WRIGHTII (Gray) Trel.: fruit, *Wright 834.* 104. T. FENDLERI Engelm., var. SINUOSUM Boivin: fruit, *Nelson 4749.* 105. T. FENDLERI Engelm., var. QUADRINERVATUM Boivin: fruit, *Wiggins & Demaree 4941.* 106. T. POLYCARPUM (Torr.) Wats.: a) sepal of pistillate flower, *Kellogg & Harford 3;* b) stamen, *Hansen 563;* c) fruit, *Smith 306.* 107. T. REVOLUTUM DC.: a) stamen, *Pease 3782;* b) sepal of staminate flower, id.; c) sepal of pistillate flower, *Rich*, Stoneham; d) ovary, id.; e) seed, *Fernald & Weatherby 16,807;* f) fruit, id. 108. T. MACROSTYLUM Small & Heller: a) sepal of pistillate flower, *Small & Heller*, Hickory; b) sepal of staminate flower, *Small & Heller 428;* c) stamen, *Small & Heller*, Hickory; d) fruit, *Small & Heller 1015.* 109. T. SUBROTUNDUM Boivin: a) ovary, *Godfrey & Tryon 121;* b) stamen, id.; c) peduncle and fruit, id. 110. T. POLYGAMUM Muhl.: a) stamen, *Burnham*, Tripoli; b) fruit, *Robinson*, Rangeley Lakes; c) head of mature carpels, *Muenscher & Clausen 4649.* 111. T. POLYGAMUM Muhl., var. HEBECARPUM Fern.: a) stamen, *Fernald & Williams*, Rivière du Loup; b) fruit, *Fernald & Long, 28,274.* 112. T. POLYGAMUM Muhl., var. INTERMEDIUM Boivin: stamen, *Woodward*, Franklin. 113. T. DASYCARPUM Fisch. & Lall.: a) head of mature carpels, *Lunell*, Lake Ibsen; b) stamen, *Moseley*, Oxford. 114. T. DASYCARPUM Fisch. & Lall., var. HYPOGLAUCUM (Rydb.) Boivin: a) ventral side of an immature fruit showing the fully expanded stigma and the small hole in the wall of the ovary near the base of the style, *Stevens 920;* b) stamen, *Palmer 3969.*

Why Acerates floridana? The genus *Acerates* Ell. is well distinguished from *Asclepias* and its type was *Acerates longifolia* (Michx.) Ell. Sk. i. 317 (1817), based on *Asclepias longifolia* Michx. Fl. Bor.-Am. i. 116 (1803). There is no question about the identity of *Acerates longifolia* and the name was correctly applied until it was thought to have been upset by Hitchcock in Trans. Acad. Sci. St. Louis, v. 508 (1891), where, in enumerating plants of Ames, Iowa, Hitchcock made the unexplained combination:

Acerates Floridana, (Lam) [I follow Hitchcock's punctuation].—*Asclepias Floridana*, Lam. Dict. i.—*Acerates longifolia*, Ell. Sk. 1.

One might wonder at the omission of page-numbers in the citations. That was presumably because the maker of the new combination had not looked them up; if he had, and if he had read Lamarck's relatively simple Latin and French accounts of his *Asclepias floridana*, he could promptly have seen that Lamarck's plant had nothing to do with *Acerates longifolia*. The new combination, however, was promptly accepted at its face value and it seems to have occurred to no one to check on the original description of *Asclepias floridana!* Pennell, however, giving a clear statement of characters, differentiated the southern Coastal Plain species, which he maintained unquestioned as *Acerates floridana*, from the Mississippi Valley plant (which Hitchcock had had before him), the latter described as the well defined *Acerates hirtella* Pennell in Bull. Torr. Bot. Cl. xlvi. 184 (1919).

Familiar with the linear-leaved plant of the Southeast, which has been erroneously passing as *Acerates floridana*, I was, to put it mildly, surprised, upon looking up the photograph from Lamarck's Herbarium of the plant marked by him *Asclepias floridana;* and the wonder has not ceased to grow, because it well accords with his description, since it is a narrow-leaved and simple-stemmed *Asclepias tuberosa* L.! This is as it should be, for, after describing as his species no. 22, *A. tuberosa*, with velvety (velue) stem branching, the lanceolate leaves velvety and pale beneath (velues, & d'une couleur pâle en dessous), the umbels simple and lateral or terminal, the flowers orange-red, Lamarck followed it with his

23. Asclepiade de la Floride, *Asclepias Floridana, Asclepias foliis alternis lanceolato-linearibus, umbellis terminalibus; caule simplici piloso.* N. *An Apocynum rectum Floridanum, ranunculi flammei majoribus folio, floribus umbellatis aureis,* Pluk. Amalth. 18. Tab. 359. f. 4.

Cette espèce a beaucoup de rapport avec celle qui précède [*A. tuberosa*]; & a, comme elle, sa tige velue, ainsi que le dessous de ses feuilles; mais elle en diffère par ses feuilles étroites, lancéolées-linéaires, & fort rapprochées les uns des autres, & par sa tige simple, qui porte à son sommet une ou plusieurs ombelles terminales.—Lam. Encyc. Meth. i. 284 (1783).

In other words, Lamarck was ahead of his time. He was separating as a species small and narrow-leaved individuals of *Asclepias tuberosa* with the umbels all terminal; had he realized the full possibilities he could have proposed from the Atlantic States alone at least a dozen equally useless and inconstant segregates. At any rate, *Asclepias floridana* Lam., a small state of *A. tuberosa*, with velvety stem, velvety leaves, strictly terminal umbel or umbels and orange-red flowers, should not force out the correct name Acerates longifolia (Michx.) Ell., which belongs to a nearly glabrous to barely puberulent-stemmed plant, with (1–)2–15 umbels scattered in the upper leaf-axils, the terminal one much overtopped by the glabrous and stiff leaves, the corolla, to quote Elliott, author of the genus *Acerates*, "cinerous, tipped with purple". The misidentification is an old one; some one gussed wrong and his guess was never checked. That an author in these days should make a transfer without at least looking up the original description should be incredible; but in case of some who have looked upon name-changing as merely the opportunists' basket of plums, the incredible is likely to be as frequent as the credible.

When Lamarck noted that his *Asclepias floridana* was near the *Apocynum rectum Floridanum* . . . *floribus umbellatis aureis* of Plukenet, ser. 18, pl. 359, f. 4, he was pretty far from the mark. Plukenet gave a beautiful illustration of the plant later described as *Asclepias lanceolata* Walt. The vivid color alone suggests *A. tuberosa.*

People constantly ask why the *Manual* requires more than a few months to revise. So long as hopelessly blundering and inaccurate publication is encouraged, the more the need for clearing up! That kills time.—M. L. Fernald.

Thesium Linophyllon in North Dakota, a first Record for North America.—In July, 1943, Mr. William J. Leary, extension agronomist, brought me several stalks of a strange plant which he had found near Cando, Towner County, North Dakota. About September 1, Mr. Woodrow Wieland, county extension agent at Cando, secured for me additional material, some of which has been distributed under my No. 754. Dr. N. C. Fassett identified the plant as a species of *Thesium* and suggested that he believed this was the first record of it for North America. Later Dr. M. L. Fernald examined one of the sheets and reported that it agreed very well with *T. Linophyllon* L. of Europe.

On May 26, 1944, Mr. Wieland again sent specimens then showing a vigorous growth about two dm. high, but not yet in bloom. On June 13, I was able to visit the location. The plants were then in full bloom and had as many as 40 stems arising from one root. The appearance of the plant with slender, tufted stems, 3–5 dm. high, with slender leaves and many small white flowers, solitary but pedicelled in the axils, is scarcely like anything else in our flora.

The plant seems to be quite common in Europe and while not mentioned in most weed books, one might well have expected that it would have appeared in America earlier.

On account of its reported parasitic habit on roots of other plants we did some digging, but we had arrived just between two hard showers so our studies were rather brief. The plants were scattered for some rods along two sides of a field and surrounding plants were mostly *Bromus inermis*. The field was planted to grain and neither it nor its history was investigated. On account of the location of the plants, the suggestion is rather strong that seeds of the *Thesium* may have been introduced with *Bromus* seed. We did find a number of white, tubercle-like bodies about 1 mm. in diameter, closely attached to old rhizomes of *Bromus*. These seemed to grow from fine branches of the *Thesium* roots.—O. A. Stevens, North Dakota Agricultural College, Fargo, North Dakota.

The Confused Publication of Monarda Russeliana.—In his Journal of Travels into the Arkansas Territory, 141 (1821) Nuttall first mentioned *Monarda Russeliana,* the mere name accompanying the note on one of his trips out from Major Bradford's garrison: "At the benevolent request of the commander, and agreeably to my intentions of exploring the natural history of the territory, I resolved to spend a few weeks at the garrison, and make it the depot of my collections. It is with a satisfaction, clouded by melancholy, that I now call to mind the agreeable hours I spent at this station, while accompanied by the friendly aid and kind participation of Dr. Russel, whose memory I have faintly endeavoured to commemorate in the specific name of a beautiful species of *Monarda.* But relentless death, whose ever-withering hand delights to pluck the fairest flowers, added, in the fleeting space of a few short days, another early trophy to his mortal garland; and Russel, the only hope of a fond and widowed mother, the last of his name and family, now sleeps obscurely in unhallowed earth! Gentle Reader, forgive this tribute of sympathy to the recollection of one, whom fully to know was surely to esteem, as a gentleman, an accomplished scholar, and a sincere admirer of the simple beauties of the field of nature."

After such a tribute a later botanist, to use Nuttall's expression, would be "clouded by melancholy" at having to discard the name *Monarda Russeliana.* The plant which Nuttall had and which he clearly described under that name in late 1835 or earliest 1836 is very definite, but, unfortunately, several years before Nuttall himself gave his account of it the Englishman, John Sims, in Curtis's Botanical Magazine ("for the Use of . . . Ladies, Gentlemen, and Gardeners"), li. t. 2513 (1824), gave a detailed description and an unequivocal plate, as *M. Russeliana,* "Raised from seed received from Professor Nuttall, under the name we have adopted," of the other sessile-leaved but coarser plant of Arkansas and adjacent states, the species discovered "During my [his] residence in Missouri, in the years 1820, 21, and 22" by Dr. Lewis C. Beck and destined to be described by him in Am. Journ. Sc. x. 260 (1826) as *M. Bradburiana,* this name, like Nuttall's, "as a tribute to the memory of a highly valued friend", "the late John Bradbury, F. L. S."

Aside from the loss of so well known a name as *Monarda*

Bradburiana (1826), which must obviously give way to *M. Russeliana* Nutt. ex Sims, Bot. Mag. li. t. 2513 (1824), not Nutt. (1835 or 36), the confusion resulting from a shifting of familiar names is unfortunate. This situation was, apparently, not noticed by McClintock & Epling, Univ. Calif. Pub. Bot. xx. 161–163 (1942), for they cite the Botanical Magazine description and plate without question as belonging with Nuttall's plant described in late 1835 or earliest 1836. Accepting their identification, based upon examination of a specimen so named and collected by Rafinesque (in Herb. Delessert) we must take up for *M. Russeliana* Nutt. (1835 or 36) not Nutt. ex Sims (1824) the name *M. virgata* Raf. Med. Fl. ii. 37 (1830).

In *Monarda Russeliana* (1824) = *M. Bradburiana* Beck (1826) the ovate to ovate-lanceolate leaves are longer than to two-thirds as long as the internode above, the blades at the 2nd node below the glomerule 2–5 cm. broad and dentate-serrate, and the slender corolla-tube (below the dilated throat) is included in or barely exserted from the calyx. In the more slender *M. virgata*, on the other hand, the leaves are only a third to rarely half as long as the very slender internodes, those of the 2nd node below the relatively small glomerule lance-acuminate, less toothed to entire and only 0.8–2 cm. broad, while the slender corolla-tube is long-exserted from the calyx (McClintock & Epling give for the coarser species "calyces 9–14 mm. long . . . . corolla . . . tube 12–19 mm. long", *i. e.*, 3–5 mm. longer than calyx; in their *M. Russeliana* "calyces 8–12 mm. long . . . , corolla . . . tube 11–25 mm. long", *i. e.* up to 13 mm. longer than calyx). Now if the original description and plate of *M. Russeliana* Nutt. ex Sims be examined it will be seen that the stem (3–4 mm. in diameter) is much stouter than in *M. virgata*, that the leaves of the 2nd node below the glomerule are 3 cm. broad and coarsely dentate-serrate, and that the corollas are those of *M. Bradburiana.* There seems to be no escape, then, from using the name M. Russeliana Nutt. ex Sims (1824) for *M. Bradburiana* Beck (1826) and M. virgata Raf. (1830) for *M. Russeliana* Nutt. (1835 or 36).

As indicated on the labels, *Monarda Russeliana* (*Bradburiana*) flowers and matures somewhat earlier than *M. virgata.* It is evident that Nuttall, collecting and describing flowering material

of the latter (ISOTYPE in Gray Herb.), secured the already mature fruit of the former and sent seeds to England. The confusion probably started with Nuttall himself.—M. L. FERNALD.

CROTALARIA SAGITTALIS IN INDIANA.—In the 7th edition of Gray's Manual the range of this species is given as chiefly coastal southward from Massachusetts, and northward in the Mississippi basin to Indiana and South Dakota. Deam, in his "Flora of Indiana," p. 592, records this species from five counties in the extreme southern part of Indiana. These counties are within the Mississippi basin. However, Deam, in his book above mentioned, taking his information from Pepoon's "Flora of the Chicago Region," cites two localities in extreme northwestern Indiana, which are in the St. Lawrence and not the Mississippi basin. One locality was along the Wabash Railway, east of Clarke, now a part of the city of Gary, Lake Co., found by Pepoon about 1900 but, according to him, "since then extinct or overlooked." Pepoon also reports in the work above mentioned the finding by Umbach of a large patch along the Lake Shore (New York Central) Railway at Dune Park in Porter Co. Deam thinks that this species has been introduced into Indiana in grass seed or as a railroad waif.

However, July 18, 1938, I found a large colony, containing at least dozens of individuals, in low sandy soil in the extreme northern portion of East Gary, Lake Co., several miles removed from the above two mentioned localities in the dune country. Originally composed of fairly high dunes, this land had been excavated for its sand at least over thirty years ago, and has become a pine barren with *Pinus Banksiana* quite conspicuous as a small tree, and *Arctostaphylos Uva-ursi* var. *coactilis* contributing much to the undergrowth. The *Crotalaria*, however, was found in the moister part of the region, among shrubby willows and *Hypericum Kalmianum*. The Wabash Railway is not far away, but I have found no plants along it. July 13, 1944, I again visited this region, and found the plants still common.

At Liverpool, Lake Co., July 28, 1944, I found two vigorous specimens, and more might have been found if time had permitted. This also was in a region excavated for its sand, and bog

conditions have developed in certain portions, with *Vaccinium macrocarpon, Calopogon pulchellus, Rhus Vernix,* and *Sphagnum* as common inhabitants. *Crotalaria,* however, was found in somewhat drier ground, among outlying small specimens of *Robinia viscosa,* a plant which has formed a dense thicket with small outlying specimens yearly appearing.

All these plants I have found belong to the St. Lawrence basin, which, however, is not far from the Mississippi basin, both being in Lake Co. It seems to me that these specimens have migrated in a natural manner, arriving in the localities after the ground has become favorable. Specimens have been sent to the Gray Herbarium.—Edwin D. Hull, Gary, Indiana.

The Geographic Segregation of Monarda fistulosa and its Var. mollis.—True *Monarda fistulosa* L. has the veinlets of the lower surfaces of the younger leaves strigose-hirsute with elongate trichomes; *M. mollis* L., whether considered a distinct species or as a variety of *M. fistulosa,* has the lower surfaces only minutely puberulent to glabrescent, at most with very short hairs. In their *Review of the Genus Monarda* in Univ. Calif. Pub. Bot. xx. no. 2: 147–194 (1942) McClintock & Epling merge the two as one species, not even separating them as varieties; and they have diligently placed upon nearly 200 sheets in the Gray Herbarium of var. *mollis* (L.) Benth.[1] or *M. mollis* L. labels stating that these plants are all *M. fistulosa.* Now it so happens that such close students of our eastern mints as Bentham, Gray, Watson, Wiegand & Eames, Deam and many others, none of them "splitters," have regularly recognized var. *mollis* as fairly distinct; and certainly in its natural range it is much more

[1] The bibliographic references to this plant, under *M. fistulosa*, in the recent *Review* would have gained by careful checking. The references as given there are: "*M. mollis* L., Amoen, Acad. 3: 390, 1764" and "*M. fistulosa* var. *mollis* L., Sp. Pl., ed. 2, 2: 32, 1762." In the Stockholm (original) issue of Amoenitates Academicae the description of *M. mollis* is in vol. iii. p. 399 (not 390); and, according to Pritzel, this volume was published in 1756 (not 1764). Furthermore, it is clear that Linnaeus did not make the combination *M. fistulosa*, var. *mollis*, wrongly ascribed to him. Looking up the reference given by McClintock & Epling, to "L., Sp. Pl. ed. 2, 2: 32" one finds that vol. 2 follows without repaging the numbering of pages of vol. 1. The first page of vol. 2 is 785; the last in vol. i, p. 784. In vol. i (not "2"), on p. 32 Linnaeus, as was his frequent custom, treated the *M. mollis* of Amoen, Acad. as an unnamed variety of *M. fistulosa:* "β. Monarda mollis. *Amoen. acad.* 3. *p.* 399." He did not give a varietal name. The varietal combination was first and correctly made by Bentham, Labiat. Gen. Sp. 317 (1833).

common and wide-spread than the plant with long trichomes on the lower leaf-surfaces. The latter has been in cultivation and in some areas is obviously a waif from such introduction. In southwestern Maine, for instance, true *M. fistulosa* is only a garden-escape, but var. *mollis* is indigenous at the borders of dry woods or in dry thickets. Taking the representation before me, I get for apparently indigenous plants the following scores: from Maine typical *M. fistulosa* 0, var. *mollis* 10; from New Hampshire 0 and 9; from Vermont 2 and 16; from eastern Massachusetts (east of the Connecticut) 3 and 29; from Connecticut 6 and 16; from upland Virginia 11 and 1; from upland North Carolina 9 and 3; from Illinois 1 and 14; from Iowa 0 and 5; from Oklahoma 0 and 10. If one applies a reading-glass to McClintock & Epling's map 8 he will note that true *M. fistulosa*, "spreading hairs only", indicated by a solid triangle, is recorded chiefly along the Appalachian Upland, from central-western Massachusetts to the mountains of western North Carolina and eastern Tennessee. That is, as it has generally been understood, most typical *M. fistulosa.* Some sheets before me give it a slightly broader range but, surely, var. *mollis*, usually without any striking transition in pubescence of leaves, is by far the more widely dispersed and generally commoner extreme of the species.

M. FISTULOSA L., var. **menthaefolia** (Graham), comb. nov. *M. menthaefolia* Graham in Edinb. New Phil. Journ. 387 (1829). *M. mollis*, var. *menthaefolia* (Graham) Fernald in RHODORA, iii. 15 (1901).

Var. *menthaefolia* is the chief representative of *Monarda fistulosa*, var. *mollis* in the Great Plains and Rocky Mountain regions, extending eastward to Manitoba and Minnesota and distinguished by its stiffer and mostly simpler and lower stems and shorter-petioled leaves, the normal responses to a more arid climate and soil. I am quite unable to follow Rydberg, Nelson, McClintock & Epling and others who maintain it as "a species of the Rocky Mountains ranging into Texas south of New Mexico" (a novel way of saying south to Trans-Pecos Texas), the range given by the latter authors in their key (their p. 157); neither were Bentham, Gray and some other earlier students of the group, who even gave up trying to separate var. *menthaefolia* from var. *mollis.* On the whole it is a reasonably good geographic

variety, ranging, as actually cited and mapped by McClintock & Epling, to the northern tip of Vancouver Island at the west, to the border of Minnesota at the east. In the eastern part of its range it passes insensibly into var. *mollis* and various specimens in the Gray Herbarium labelled by the recent reviewers of the genus as *M. menthaefolia* are inseparable from others marked by them as *M. fistulosa*.—M. L. Fernald.

The Validity of Lithospermum latifolium.—In the Report of the State Botanist of New York for 1921, House treats *Lithospermum latifolium* Michx. Fl. Bor.-Am. i. 131 (1803) as a later homonym and proposes, N. Y. State Mus. Bull. no. 243–244: 61 (1923), a new combination for it:

Lithospermum luteum (Raf.) comb. nov.

L. latifolium Michx. Fl. Bor. Am., I: 131. 1803. Not Forsk. 1775
Cyphorina latifolia Raf. Am. Mo. Mag., 4: 191. 1819
Cyphorina lutea Raf. Cat. 13. 1824
L. lutescens N. Coleman, Cat. Pl. Grand Rapids. 29. 1874

Passing for the moment the fact that Rafinesque's proposed genus was *Cyphorima*, the most important point is House's belief that Forskål published a species *Lithospermum latifolium* in 1775. To be sure, this name was given by Jackson in Index Kewensis, under *Lithospermum: "latifolium,* Forsk. Fl. Aegypt. Arab. 39 = callosum"; but this seems to be one of the hundreds of cases where those who worked on Jackson's great bibliographic undertaking "put one over on him". Search in two copies of Forskål shows no *L. latifolium;* he had 5 species of that genus, *L. hispidum* (p. 38), *L. heliotropioides* (p. 39), *L. ciliatum* (p. 39), *L. angustifolium* (p. 39) and *L. digynum* (p. 40). There is no *L. latifolium* but the last phrase on the page, following the habitat, "In desertis Káhirinis", and the Arabic name, is "Charactere *Lithosp. Purp. caer.* sed nec repens, neque latifolium". The last line ends halfway across the bottom of the page and its final "latifolium" evidently caught the eye of the tired indexer. Wondering how Jackson got the clew that the supposed *L. "latifolium,* Forsk." of Index Kewensis was the same as *L. callosum,* said by Jackson to grow in "Am. bor.; Peruv.", we

find it by turning to the original account of *L. callosum* Vahl, Symbolae Botanicae, sive Plantarum, tam earum, quas in Itinere, inprimis Orientali, collegit Petrus Forskål, etc. i. 14 (1790). Vahl said nothing about North America and Peru. Instead, he based his *L. callosum* upon the *L. angustifolium* Forsk. and, like Forskål, gave its "Habitat in desertis Kahirinis". In other words, *L. callosum* Vahl (1790) was an illegitimate substitute for *L. angustifolium* Forsk. (1775). There is apparently no *L. latifolium* Forsk.[1], *L. callosum* did not come from "Am. bot.; Peruv.", and *L. "angustifolium*, Forsk. Aegypt. Arab. 39 = callosum" of Index Kewensis should read *callosum* Vahl, Symb. Bot. i. 14 = angustifolium; to those who are not callous to puns the whole story is one of extreme carelessness.

There is no need for the name *Lithospermum luteum* (Raf.) House (1923). As originally published by Rafinesque, Cat. 13 (1824), the name *Cyphorima lutea* was a substitute-name for a species already with a valid name, therefore illegitimate; Rafinesque simply said "Cyphorima lutea Raf. Lithospermum latifolium auct [i. e. Michaux.]". The genus *Cyphorima* had been properly published by Raf. Am. Mo. Mag. Crit. Rev. iv. 191 (1819) with the brief but definite characterization:

> "32. *Lithospermum latifolium*, *Batschia longiflora*, and *B. decumbens*, N., must form a peculiar genus *Cyphorima*, distinguished by having five protuberances at the mouth of the corolla, gibbose inside, hollow outside."

As Dr. Merrill points out to me, neither here nor in later publications did Rafinesque make formal transfers of the specific names. These transfers were made for him by Jackson in Index Kewensis, Jackson repudiating the genus *Cyphorima* and reducing it to *Lithospermum*, his combinations, consequently, published in synonymy; they should, therefore, be quoted as *C. decumbens* Raf. ex Jackson in synonymy, and *C. latifolia* [Jackson said *-ium*] and *C. longiflora* do. Such are the intricacies of nomenclature and bibliography!—M. L. FERNALD.

[1] In Contrib. Gray Herb. n. s. lxx. 26 (1924) Dr. I. M. Johnston noted that "Forskål did not publish such a binomial."

Volume 46, no. 551, including pages 389–450, was issued 9 November, 1944.

ERRATA

Page 14, line 26; *for* 1917 *read* 1817.
Page 14, line 30; *for* 810 *read* 811.
Page 37, line 25; *for* "dry *read* dry.
Page 43, line 29; for *fibrosa* read *fibrosum.*
Page 45, line 25; *for* Barton's *read* Bartram's.
Page 81, line 30; *for* mediacids oils *read* mediacid soils.
Page 108, line 33; *for* Bombat *read* Bamber.
Page 109, line 15; *for* North *read* north of.
Page 113, line 34; *for* Delaware (one collection) *read* New Jersey, Delaware.
Page 126, line 7; *for* Bombat *read* Bamber.
Page 198, line 1; *for* 4–7 *read* 8–12.
Page 198, line 3; *for* 7–12 (14) *read* 12–24.
No. 548, Contents, lines 10 and 12; *for* 215 and 216 *read* 315 and 316.
Page 333, line 3; for *arvensis* read *canadensis.*
Page 341, line 24; *for* Cincineria *read* Cincinneria.
Page 351; *for* 6 *read* 4.
Page 366, line 41; *for* Cobwell *read* Cowbell.
Page 372, line 7; for *pedunculorum* read *pedunculi.*
Page 402, line 25; *for* 66 *read* 68.
Page 403, line 28; *for* 69 *read* 70.
Page 443, line 10; *for* Withman *read* Whitman.

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